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## ORIGINAL ARTICLES.

### THE DIURETIC VALUE OF CALOMEL AND UNUSUAL TOLERANCE OF THIS DRUG IN A CASE OF CARDIAC AND RENAL DISEASE.

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IN the treatment of chronic diseases nothing is more gratifying than the possession of various remedies or plans of treatment by which one end may be obtained. Not only is this true of the treatment of different patients in whom various individual peculiarities or associated conditions may contra-indicate or render useless one or another remedy, but also and only to a slightly less extent is it true in the treatment of the same individual. There is, perhaps, no remedy that may be continued indefinitely with the same happy effect as attended its first exhibition; and in every chronic case conflicting conditions will from time to time arise that make it undesirable to continue a course of treatment in every way satisfactory so far as the immediate end and aim of that treatment is concerned, but undesirable on account of other effects produced. This is eminently true of the treatment of heart-disease. Valuable as is digitalis, and thoroughly acknowledged as is its preëminence as a cardiac stimulant and tonic, no one would deny the usefulness of other cardiac remedies—of strophanthus, of strychnin, of nitroglycerin and others—in their own proper sphere or in cases in which digitalis has lost its influence or is contra-indicated; and any work devoted to the study of these remedies of lesser value will prove useful in times of greatest need when the potent remedy has failed and other aid is imperatively demanded.

These preliminary remarks are pertinent to the question of the diuretic value of calomel. This drug is certainly of less general value as a diuretic, and more frequently entirely valueless than many others; but there are cases (and the one here to be briefly described proves this) in which the great efficiency of calomel justifies and repays the labor given to the investigation of this subordinate action of the drug in question.

The diuretic action of calomel is not a newly-discovered fact, though only of recent years has it engaged attention prominently. The indications governing its use for this purpose, and the precautions necessary to the fullest success of the treatment, are recent additions to medical knowledge, and are perhaps still but imperfectly established. Before discussing these points, however, it will be well to abstract the notes of a case that strikingly illustrates the salient features of the question.

G. W. H., aged thirty-nine years, had for some years been engaged as a post-trader at one of our frontier stations in Dakota. His family history does not bear on the case. During a number of years he was much exposed to the vicissitudes of a rigorous climate, and had once suffered a sharp attack of rheumatism, from which recovery was apparently perfect. Subsequently, in 1890, he was suddenly seized with great epigastric pain, and became jaundiced. The history of this attack leaves little doubt but that it was one of biliary colic. Under treatment and careful regimen he recovered, and remained well until December, 1892, when he began to suffer with epigastric pain, especially after eating, shortness of breath, and swelling of the feet. These symptoms persisted, and in February, 1893, he came to Philadelphia for treatment. During the journey eastward he was taken very ill at St. Paul, and was confined to bed two weeks with increased edema and a palpitating and severe aching pain in the back. On his entrance to the hospital we found him in the state described, and detected on examination a loud to-and-fro aortic murmur that completely obscured the heart-sounds. The vessels of the neck pulsated violently; the pulse was quick and collapsing. In short, the evidences of extreme aortic regurgitation were unmistakable. The urine was scanty, high-colored and dense; there was considerable albumin and numerous hyaline and slightly granular casts, with some blood-cells.

The man remained in the hospital from February until the middle of June, during which time his condition was much the same, though at times there was great improvement. The urine cleared up to such an extent that albumin disappeared entirely for a time, and casts could not be found. In addition to the general condition described there were frequent attacks of most alarming cardiac asthma and cyanosis, which after great difficulty proved controllable. In June he was so much better that he was enabled to return to his mother's home in Indiana, and during the summer he was quite comfortable. Indiscretions and neglect of treatment led to a relapse of his previous bad state, and he returned to Philadelphia in September. There were now, as before, great dyspnea, dropsy of the legs, palpitation, throbbing of the vessels, and frequent attacks of cardiac asthma and cyanosis. The urine was still

greatly lessened in quantity, and albumin and casts were abundant. No important changes were noted, excepting occasional improvement and subsequent relapses, until September 7, 1894, when he was suddenly taken with a severe chill, which lasted for a half-hour and was followed by copious sweating. No change in the heart-signs was detected on a careful physical examination, and the temperature regained the normal in thirty six hours. Subsequently a number of chills, with sudden elevation of temperature, occurred, and during several of these the patient suffered agonizing abdominal pains. The urine became loaded with albumin, then hematuria set in, the spleen became enlarged and tender, and the patient's general condition left no doubt as to the occurrence of embolism of the kidneys and spleen and of a general septic condition, probably from malignant endocarditis. The heart-signs remained unaltered. Finally wild delirium led on to coma, and the patient died October 25, 1894.

The treatment of this case was most instructive. In spite of the serious nature of the cardiac lesion and of the kidney-complication, the improvements under treatment were at times simply marvellous. During the early part of 1893 his condition was so serious that members of his family were summoned from Indiana, and his death was expected hourly. The urine was reduced to from eleven to fifteen ounces, and was loaded with albumin; the pulse was extremely feeble, and attacks of asthma and cyanosis followed each other in rapid succession; a large part of the time the patient was stuporous; yet, in spite of all this, improvement slowly manifested itself, and he recovered sufficiently to leave the hospital in June.

The most serious condition, the attacks of asthma and cyanosis, persisted in spite of every treatment until morphin and atropin were administered hypodermically. These remedies were at first used with great reluctance, on account of the diminished renal secretion and the albuminuria; but finally were forced upon us by the serious character of the asthmatic attacks. Subsequently morphin was used almost continuously, and often in large quantity. During the period from January 1st to March 14th, 1894, the total quantity of morphin administered hypodermically was 294 grains, or a daily average of about 3.5 grains. During February alone the quantity was 156 grains, or over 5.5 grains per day. The greatest quantity used (during one of the embolic attacks) was 18 grains; the least, 2.5 grains. At no time did the morphin in any way affect the secretion of urine noticeably; on the contrary it seemed that the general relief afforded rather tended to favor renal secretion. Sweating was always copious, but no distinct influence could be traced to the morphin, and with aortic regurgitation the symptom was not unexpected.

The most striking feature in the treatment of this case was the influence of calomel. This drug was used repeatedly with the most decided benefit. Under its influence there was invariably a great increase in the quantity of the urine secreted, and, in consequence of this, relief of dropsy and of the general symptoms. This effect was obtained only when the dose of calomel was a large one, and never lasted more than a week or ten days. Minute doses of calomel, gr. $\frac{1}{40}$, given hourly, failed entirely; larger doses were efficient in proportion to the dose, the greatest daily excretion, 140 fluidounces, occurring under the influence of three-grain doses administered every six hours. Scarcely less notable than the tolerance of the patient for morphin was his tolerance for calomel. During one period of three weeks he was given 210 grains of the drug, or about 10 grains daily, without the slightest indication of mercurialization, in spite of the fact that for weeks before smaller quantities had been administered almost continuously. The diuretic action is, perhaps, best illustrated by the following extracts from the notes:

| | | Fluidounces. | |
|---|---|---|---|
| March | 10. | Quantity of urine in 24 hours, | 15 |
| | 11. | " " | 19 |
| | 12. | " " | 30 |
| | 13. | " " | 28 |
| | 14. | " " | 29 |
| | 15. | " " | 45 |
| | 16. | " " | 45 Calomel gr. iij every 6 hours. |
| | 17. | " " | 85 |
| | 18. | " " | 137 |
| | 19. | " " | 141 |
| | 20. | " " | 126 |
| | 21. | " " | 133 |
| | 22. | " " | 106 |
| | 23. | " " | 60 Calomel stopped. |
| | 24. | " " | 43 |
| | 25. | " " | 27 |
| July | 10. | " " | 19 |
| | 11. | " " | 23 Calomel gr. $\frac{1}{6}$ every 2 hours. |
| | 12. | " " | 28 |
| | 13. | " " | 42 |
| | 14. | " " | 53 Calomel gr. $\frac{1}{4}$ every 2 hours. |
| | 15. | " " | 60 |
| | 16. | " " | 92 |
| | 17. | " " | 93 |
| | 18. | " " | 84 |
| | 19. | " " | 66 |
| | 20. | " " | 44 |
| | 21. | " " | 40 Calomel gr. $\frac{1}{2}$ every 2 hours. |
| | 22. | " " | 70 |
| | 23. | " " | 84 |
| | 24. | " " | 90 |
| | 25. | " " | 63 |
| | 26. | " " | 41 |
| | 27. | " " | 38 |
| | 28. | " " | 41 |
| | 29. | " " | 32 Calomel stopped. |
| Aug. | 23. | " " | 30 Calomel gr. $\frac{1}{40}$ hourly |
| | 24. | " " | 20 " " $\frac{1}{20}$ " |
| | 25. | " " | 25 " " $\frac{1}{10}$ " |
| | 26. | " " | 35 " " $\frac{2}{10}$ " |
| | 27. | " " | 44 " " $\frac{3}{10}$ " |
| | 28. | " " | 47 " " $\frac{4}{10}$ " |
| | 29. | " " | 62 " " j. " |
| | 30. | " " | 81 |
| | 31. | " " | 130 |
| Sept. | 1. | " " | 103 |
| | 2. | " " | 106 |
| | 3. | " " | 101 |
| | 4. | " " | 98.5 |

| | | Fluidounces. | |
|---|---|---|---|
| Sept. | 5. Quantity of urine in 24 hours, | 66 | Calomel discontinued. |
| | 6. " " | 43 | |
| | 7. " " | 31 | |
| | 8. " " | 30 | |
| | 9. " " | 20 | |
| | 10. " " | 25 | |
| | 11. " " | 20 | |

These tables show graphically the very powerful diuretic influence of the drug in this case, how under large doses the amount of urine increased immemediately, and maintained itself at a high figure for several days, only to fall as rapidly as it rose. It was equally evident that the drug was most active when dropsy was marked and when the bowels were kept in check. Rarely ever in this patient was there the least tendency to purgation. This is partly due to the large quantities of morphin administered; but from the comparative ease with which he could be purged with other remedies, this explanation does not suffice. There was undoubtedly a tendency rather to diuresis than to purgation under the influence of calomel in this patient. Whether the existenee of dropsy plays a part in this modified action is unsettled. Certainly it would appear that calomel increases diuresis in dropsical patients, by causing absorption of serum and rapid elimination by the kidneys. The recent cases of Palma are interesting in this connection. In six cases of cirrhosis of the liver, with ascites, large doses of calomel proved actively diuretic in four, the two negative results being in well-advanced cases. In one case of secondary carcinoma of the liver with ascites the drug acted most powerfully, and the ascites rapidly disappeared. In two cases (hypertrophic cirrhosis and carcinoma of the bile-ducts) without ascites, on the other hand, little or no diuretic influence was noted. The rapid loss of the diuretic power is rather peculiar to this drug, but was so constantly noted in the case reported, and has been so uniformly observed by others, that it seems an established fact. After a few days' interval the calomel acts as effectively as before. The dose should be not less than one grain every three hours, and the bowels should be controlled by opium. Constant use of antiseptic mouth-washes, no doubt, contributed to the avoidance of stomatitis in this case, and should never be neglected.

Other diuretics, such as diuretin, spartein, digitalis (this, however, was used almost continuously) were active to a degree, but far less efficient, and sometimes attended by unpleasant symptoms. Diuretin, in ten-grain doses, was the most active, but caused headache and vomiting and had to be discontinued. The patient died in apparently a septic state and with symptoms of heart-failure. The autopsy showed distorted and agglutinated aortic leaflets, without much thickening or calcification. Recent malignant endocarditis of the mitral and aortic valves was detected. The heart-cavities were filled with somewhat dense thrombi clinging to the trabeculæ and chordæ tendineæ. The kidneys presented the lesions of an old nephritis, together with recent congestion and hemorrhagic infarctions. The spleen was enlarged and contained fresh infarcts. The liver was large and fatty; the lungs congested posteriorly, and the other organs normal.

## *MYXEDEMA AND ITS DIFFERENTIAL DIAGNOSIS FROM CHRONIC NEPHRITIS.*

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THERE are very few diseases that have excited more interest in the medical world within the past decade than myxedema, and there are very few discoveries in the domain of therapeutics that have been so brilliant as the treatment of this disease by thyroid extract. The history of the discovery of the remedy reads like a novel. The clinical features of the disease were carefully determined by a committee of the Clinical Society of London in 1889, but its origin remained unknown. The observations of surgeons, that a similar affection followed the removal of goiter, gave the first clue to the origin of the clinical symptoms. The brilliant researches of Horsley, by means of physiologic experiment, determined the function of the thyroid gland in maintaining the body-temperature and the nutrition of various parts of the system, and proved that the absence of the gland caused the symptoms of myxedema. Finally, the idea developed of transferring to the human body the thyroid glands of animals, either by direct transplantation (Horsley and Kocher) or by subcutaneous injection (Murray) or by ordinary administration by the mouth (Mackenzie), for the purpose of removing the symptoms of myxedema, which were due to the absence of this substance from the blood. The success of this method completed the history of the affection.

Those who have seen the very distressing physical and mental symptoms occurring in myxedema rapidly and progressively disappear under the administration of thyroid extract, until the patients are restored to perfect health, cannot but be impressed by the wonderful effect that the presence of this active principle in the blood has had. It has been my fortune to watch this transformation from a state of disease to a state of health in fourteen adults. The histories of several of these cases have been already published by myself[1] and by others.[2]

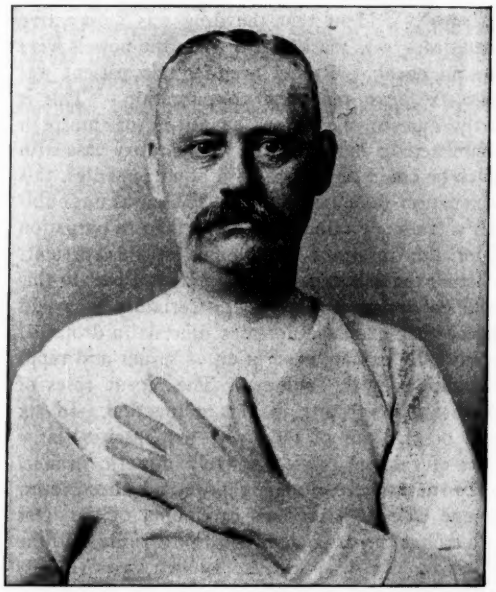
[1] Transactions of the Association of American Physicians, 1893, vol. viii, p. 361, three cases.

[2] Dr. George W. Crary, American Journal of the Medical

My object in reporting another case at this time is to call attention to certain features of myxedema that closely resemble the symptoms of chronic nephritis and to emphasize the importance of the distinction between these two diseases. This can hardly be exaggerated, for many of the cases of myxedema that are now cured had been considered cases of nephritis of an incurable nature, a mistake easily accounted for when we consider that the presence of albumin and of casts in the urine, together with an appearance of general edematous swelling of the body, is uniformly noticed in this disease. After recording the history of the following case an attempt will be made to indicate the chief points of differential diagnosis.

FIG. 1.

FIG. 2.



G. W. H., aged forty-five, had been perfectly well until the early part of 1892, when without any known cause he began to suffer from a gradually increasing swelling of the hands, face, nose, mouth, and tongue, which was accompanied by the appearance of a yellow pigmentation upon the hands and face and a decided thinning of the hair. This condition gradually increased during the summer, and he found that he was unable to perspire, no matter how hot the weather. During the autumn, in addition to the symptoms mentioned, he noticed that his teeth were loose, that the gums were sore, bled quite frequently, and seemed to be soft; that the swelling of the mouth and tongue had become so great as to materially change the character of his voice, making talking monotonous and decidedly slower; and that the swelling also interfered with breathing easily through the nose, so that he kept his mouth open, and at times had some difficulty in swallowing. As winter came on he suffered more from the cold than he had ever done previously. The swelling had by this time gradually extended over the entire body, giving him the appearance of being rather fleshy, so that his tailor had to let out his clothing an inch-and-a-half about the waist. The appearance of his face during this time had progressively altered, and presented certain peculiarities; the hair of the head had become coarse and rather thin; the hair of his moustache was also coarser than formerly and had become bristly, so that it could not be kept smooth as formerly; the skin of the entire face was thickened and pigmented; this was particularly noticeable about the forehead, where deep wrinkles appeared, and around the eyes (which could hardly be opened to their full extent), and about the mouth, where the lips were thick and heavy; there was a peculiar elevation of the external corner of the eyebrows in the effort to open the eyes; and a thickening of the face at the side of the nose was very perceptible. His extremities were also swollen and pigmented; the skin all over the body was dry and scaly. His friends had noticed the slowness of his speech and the peculiar thickness of utterance. Many of these characters are well shown in his photograph (Fig. 1), which was taken in May, 1894.

The diagnosis of myxedema was made by his physician in San Francisco, in September, 1893, and the thyroid treatment had been begun about that time and kept up until May, 1894, when I first saw him. Whether the preparation used had been defective or imperfectly prepared I do not know;

Sciences, April, 1894, two cases; also, Dr. S. J. Meltzer, N. Y. Medicin. Monatschr., April, 1894, one case.

but his improvement had been slow, though perceptible, during the winter. When I saw him in May I observed, in addition to the symptoms and appearance already noticed, very marked supraclavicular swellings, slightly subnormal temperature, a marked slowness mentally, attended by a tendency at times to feelings of depression and the characteristic speech of myxedema. He had not had hallucinations, and the mental hebetude was less than I have seen in other cases. Examination of the urine showed the presence of small amounts of albumin and a few large and small hyaline casts; his pulse was slow—60—and rather hard and irregular. He felt himself unfitted to do business by reason of his condition, and though not suffering any pain, was decidedly uncomfortable and distressed at his state. He was placed immediately upon the 5-grain tabloids of thyroid extract prepared by Burroughs, Welcome & Co., of London, these having proved to be the most active and least disagreeable of all the preparations of thyroid which I have employed. He was given three a day, but this number caused a rise of temperature and a rapid action of the heart, and hence the dose was reduced to two daily. During the following month his progress was very rapid, and the change in his appearance was extraordinary. All the symptoms gradually disappeared, excepting the pigmentation of the face and hands; the swelling subsided everywhere, so that at the end of the month he was wearing a number fifteen collar instead of a seventeen, and all his clothing was too loose; his facial expression had altered greatly for the better, and was almost like that shown in Fig. 2, a photograph taken in September, 1894. This photograph shows the remarkable change in the general appearance. There has been a corresponding change in his general feelings and in his mental capacity; he is now able to do business of an active kind with his usual ability. His voice has become natural, he has no disturbance in swallowing or breathing, and in fact, is in his usual state of health. Within a month of the beginning of treatment the albumin and casts had entirely disappeared from the urine, and there was present no evidence of any disease of the kidneys. The only unfavorable symptom that has been noticed during the course of treatment has been a marked effect of the thyroid extract upon his heart; the pulse has been persistently rapid and irregular, and he has suffered from a sense of weight and distress in the region of the heart and dyspnea on any exertion. This had never been present until the thyroid extract was used. It increased to a point of great distress when the thyroid was increased beyond fifteen grains daily, and it became less when the thyroid was stopped. He finds it necessary to take three grains of the extract, however, as, if he stops for more than two weeks, his symptoms begin to return. The distress did not appear to be very much affected by heart-stimulants and by strychnin, which were administered from time to time with a view of correcting this depressant action of the remedy. It is, of course, necessary for him to continue indefinitely the use of the thyroid extract, as this supplies to his blood an element, the absence of which produces all his symptoms.

The general appearance of patients suffering from myxedema—their cachectic look, yellowish color, and swollen faces and extremities—suggests to the ordinary observer a condition of nephritis. When the history of gastric distress and indigestion, of general malaise and fatigue on slight exertion, of headaches and mental incapacity, of insomnia, and of general edema is heard, the first suspicion is likely to be strengthened. And when the examination of the urine shows albumin and hyaline casts it seems as if the diagnosis of chronic nephritis was perfectly certain. I have made this mistake myself in two cases, and have known it to be made by some of the most accurate diagnosticians in this country before myxedema became as familiar as it is at present. Yet unless a physician has examined and studied patients suffering from myxedema he may be quite liable to this error, and hence I desire to call particular attention to the points of differential diagnosis between myxedema and chronic nephritis.

(To be concluded.)

## TREATMENT OF TYPHOID FEVER.[1]

BY CHARLES W. DULLES, M.D.,
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THE recent appearance of articles on the treatment of typhoid fever advocating principles similar to those that have impressed themselves upon me in the course of my practice prompts me to present the views on this subject that I have come to hold after nearly twenty years of observation and experience. Though these impressions differ in some ways from those that are strongly urged by certain writers on typhoid fever, I present them with confidence, because I see in various places that opinions I once held with hesitation, as unorthodox and somewhat hazardous, are held by others, independently drawing conclusions from their own experience.

My experience in the treatment of typhoid fever has ranged from cases so mild as to leave some doubt in regard to the diagnosis to cases so severe as to be marked by hemorrhages from the bowels, kidneys, and lungs, with delirium and collapse; so that I have had sufficient opportunity to test the teachings of others and the deductions from my own observations since my student days.

The principles of the treatment of typhoid fever may be summarized, I think, as consisting in: first, careful maintenance of the natural processes of excretion; second, the judicious administration of food—finding a mean between starvation and overloading the alimentary canal; third, moderate regulation of temperature; and, fourth, medication

[1] Read before the College of Physicians of Philadelphia, November 7, 1894.

reduced to the lowest possible point and shaped to meet definite indications. Nothing in these principles is novel; but I do not think the text-books put them as forcibly as might be done with advantage to students and young practitioners.

In regard to the first matter, I would say that the views in regard to auto-intoxication, expressed by Bouchard at the International Medical Congress held at Geneva, in 1877, impressed me at that time as being of very wide applicability. He applied them especially to typhoid fever, in which disease, if ever, we have an accumulation in the intestinal canal of material which taxes to the utmost the powers of elimination possessed by the patient. Here, if ever, we need to see that no interference with the process of excretion takes place, but that, on the other hand, aid shall be given to the excretory function of the lungs, the skin, the kidneys, and the bowels. For the lungs, we need fresh air, with careful avoidance of undue chilling; for the skin, we need, again, abundance of fresh air, judicious management of bed and body coverings, and the application to the skin of some form of hydrotherapy. To the kidneys unremitting attention should be given in every case of typhoid fever. The urine should be examined often for albumin and for tube-casts; and in every case the quantity of liquid drunk by the patient and the amount of urine passed should be known. I believe that much of the delirium of typhoid fever might be avoided if the kidneys were considered as carefully as the intestines. During the entire progress of a bad case the tendency of the urine to hyperacidity should be combated by the free use of water and dilute alkaline solutions. From my experience I should say that the best form of the latter is the solution of ammonium acetate with the addition of potassium acetate.[1] I have found it desirable, also, in these cases to induce patients to drink water freely, by giving it to them in forms which are agreeable to sick persons as well as to well ones: for example, carbonated waters, or plain water slightly acidulated with lemon-juice, or weak tea, hot or cold, flavored with a little lemon-juice and sugar, in the manner so widely known as "iced tea."

Of the various modes of elimination, I have chosen to refer last to that from the bowels, because it is in some respects the most important and in some respects the most neglected. My own observation leads me to think that too great fear is sometimes felt for the diarrhea of typhoid fever. This diarrhea is the result of Nature's efforts to get rid of material that is injurious to the patient; and I believe, on the one hand, it would be less likely to occur if the physician secured proper evacuations from the bowels before the diarrhea began, and, on the other hand, that lives are sometimes sacrificed in a desire to check it. This endeavor seems to overlook the indications furnished by the natural course of a case of typhoid fever, as well as the principle that the contents of foul cavities in the body—whether these be natural cavities, like the pleural cavity or the peritoneal cavity, or unnatural cavities, like those of abscesses—shall be removed. I think it important at the outset of a case of typhoid fever to secure a thorough clearing out of the entire intestinal canal—not merely a single purging, but several moderate ones, which shall quite empty the whole tract. After this I believe that the bowels should be relieved with mild saline laxatives, like Rochelle salts, or with small and repeated doses of calomel, at least every third day, unless the case is one in which Nature provides this form of relief. As for astringents, I think the occasions for their use are extremely few. This is especially true of astringents administered by the mouth. Astringents administered by rectal intubation, I think, are of little more value than simple lavements of the sort now called "enteroclysis," but which the students of Monti became familiar with some twenty years ago in Vienna, where it was called "irrigation of the colon." This I have practised on suitable occasions for seventeen years. Such irrigations are useful in several ways—for cleansing, for cooling, for assuaging thirst—but at this time I do not care to discuss details. The sum of what I believe in regard to elimination from the bowels is that it should be facilitated, and that, instead of attempting to check it, the object should be to regulate what Nature may be doing in an irritating and irregular fashion.

The second important point in the treatment of typhoid fever is, I think, the judicious administration of food. It goes naturally with what has been said in regard to checking Nature's efforts at elimination, to say that Nature should not be harassed by having burdens laid upon a weakened and irritable intestinal canal. The teachings of physiology and of ordinary common sense are opposed to the introduction into the alimentary canal of a sick person of more food than he can either appropriate or cast out. A healthy person can dispose of a large excess of unneeded ingesta, but a patient with typhoid fever cannot. I am sure I have seen patients killed and others nearly killed by relentless feeding, prac-

[1] To make a preparation of ammonium acetate and potassium acetate that is not very disagreeable, I order a mixture containing one-hundred-and-sixty grains of potassium acetate in three ounces of the solution of ammonium acetate sweetened with one ounce of syrup of lemon. To this I add ten grains of quinin sulphate, and order the mixture to be filtered by the druggist. The dose is a dessertspoonful, taken with a wineglassful of water, about four times a day. The quinin substitutes for the mawkish taste of the potassium a distinctly bitter taste, and that part of it (which is considerable) that is not dissolved in the mixture is filtered out, in order to make a better-looking preparation. To each dose I sometimes recommend the addition of a few drops of lemon-juice.

tised by physicians who have, without judgment, followed the teachings of writers who advocate what is called "regular" feeding, and especially with milk-food, in typhoid fever. Forcing patients to take measured quantities of milk at short intervals sometimes results in a diarrhea which shows that Nature repudiates the imposition—the stools resembling those of sick, milk-fed infants. At other times, when milk is given, the milk-water and salts are absorbed while the casein remains undigested and accumulates in the lower bowel until a condition of coprostasis is set up, in which the patient is subjected to the dangers of total obstruction to elimination from the bowels and to horrible pains and violence when the mass of solid feces is finally expelled by an act of Nature or by the stimulation of cathartics.

An error of another sort is committed when certain extracts of beef are administered with the idea that they are highly nutritious. To support this belief there are, I think, only an untenable theory and deductions which the facts do not warrant. I feel sure that the advantage to patients of preparations such as Valentine's meat-juice is chiefly that they are so costly that not much is likely to be given, and that they contain so little tissue-building material that they do not oppress the digestion or overload the intestinal canal. Such food probably contains, bulk for bulk, less tissue-building material than is found in the white of a chicken's egg, and is equally innocent. Beef-tea is now generally recognized as a substance which is useful for the same reason, namely, that it does not burden the intestinal canal, while it gives both patient and friends a sense of security which is very desirable in all medical cases. This suggests what I believe is one of the most important points in the management of typhoid-fever cases, namely, that they should be given as little food as possible—not as much as can be forced down them.

My own rule—which I have found has been that of others—in almost all cases of sickness, in young and old, is to say that patients may eat when they wish to, and go without eating when they have no desire for food. I let them drink all they want to, and give them food which shall resemble as little as possible those trying things that remind a patient of his sickness. I give a list of permissible foods, and tell the nurse or members of the family to get up a little meal for a patient who is conscious enough to appreciate it. I sanction the use of the albumin-water already referred to (cool water in which the white of an egg has been stirred up, with the addition of some pleasant flavor), and of almost all clear soups as they are prepared for well persons. I give milk, plain or peptonized, or made more palatable and less constipating by the addition to it of some good preparation of cocoa. I allow tea and coffee, with plenty of cream and milk, which often do good, and which I have never known to do harm if used with ordinary judgment. I have no fear of eggs, and give them whenever a patient with typhoid fever or any other fever wishes them, either soft-boiled or shirred.

Besides this, if I have a patient whose bowels are acting nicely I give custards and simple corn-starch preparations. A patient who can digest anything can digest these foods; and a patient who cannot digest anything will not want anything to eat; and, according to my views, he will require nothing but albumin-water and thin soups.

When we recall, on the one hand, the fact that persons making more or less constant exertions have gone for weeks without food and without serious impairment to their health, and, on the other hand, that fevered intestines are in no condition to do much in the way of digestion, and are capable of taking up only foods which contain finely divided or soluble hydrocarbonaceous substances and albuminoids that make their way through the intestinal walls without digestion, we can, I think, understand that not much food is needed to keep fever-patients from starving, and that this food should be of the very simplest character.

Further, when we reflect that perforation of the bowels is most likely to occur when the bowels are obstructed and distended with gas, and that this accident does not result from the unimpeded movement of soft fecal matter, but that the intestines are rather advantaged by the internal drainage which such a process secures, we can understand that, while the bowels are not constipated but moving freely, there is no need to restrict a patient to food like milk, which is almost entirely composed of water, and which has but little residue. Because I think this is true, I believe that typhoid-fever patients who have reached the stage in which they feel an inclination for food may be allowed moderate quantities of any soft food, like thick soups (digestible, of course), good fresh fish, and the soft part of oysters, with occasionally sweet-bread or beef's tongue, with eggs, milk and cream. Of vegetables, I think baked or mashed potatoes may be used, and rice and corn-starch preparations, with thoroughly boiled oatmeal and such things as spinach or well-boiled onions and very moderate quantities of toasted bread thoroughly softened with boiling hot water and seasoned, as well as soft milk-toast. For relishes, cocoa, tea and coffee may be used, and, for desserts, jellies, ice-cream, and orange-juice in moderate quantities.

The third point in regard to the treatment of typhoid fever about which I wish to speak is the regulation of the temperature. Views on this sub-

ject have undergone considerable modifications within the time covered by my own experience. At one time the greatest stress was laid upon lowering the temperature of fever-patients. This plan has given way to a more rational one, that recognizes a principle known as long ago as the time of Asclepiades, two thousand years ago—namely, that fever may of itself be a curative process or the mark of a process which is useful. I think the majority of thoughtful medical men are entirely satisfied if a patient presents the general appearance of doing well, even though the temperature be several degrees above 100° Fahrenheit. If a patient is really suffering from high temperature, I think the first attempt to reduce it should consist in having removed the needless bed-covers with which fever patients are often burdened, as the air constitutes one of the best and safest means of properly reducing the temperature. After this, I have found that sponging with cool water, especially upon the abdomen, is pleasant to the patient, and I think it has a distinctly beneficial influence upon the temperature and the inflammation within the abdominal cavity. In some cases I advise that a few light layers of muslin or gauze such as surgeons use be laid upon the abdomen and moistened at times with ice-water gently squeezed from cotton or a sponge. In a few cases I have found it convenient to have such light cloths "ironed" occasionally with a small piece of ice.

My experience with drugs given to reduce temperature by means of their physiologic action has led me to abandon their use; not because I have ever seen them do harm, but because I do not believe they really do good, and I think it better to let the temperature alone as long as it is in bounds, and, if it requires repressing, to effect this with external applications of cool air and cool water. Since I have adopted this plan I have found it to work according to the expression attributed to Asclepiades, namely, "*cito, tuto et jucunde.*"

This suggests the last of the points which I have mentioned as constituting, in my opinion, those most important in the treatment of typhoid fever, namely, that which concerns medication. I am not peculiar in believing that medication should be reduced to the lowest point and that it should be shaped to meet definite indications. As I have already said, I think the bowels should be well opened at the beginning of a case believed to be one of typhoid fever, and that when the diagnosis is established they should be kept open. I have also suggested the use of mild diuretics, the tendency of which is to reduce the acidity of the urine and to increase the solubility of its solid contents. With these procedures, intended to aid elimination, I think it is useful to administer what are known as intestinal antiseptics. These appear to do something which is not yet explained by any laboratory-observations; and, from the time when turpentine was first used until the present time, when it is the rival of modern chemic inventions, intestinal antiseptics have seemed to be of distinct value in the treatment of typhoid fever; for, in addition to their purifying action in the bowel, they appear to exercise a beneficial influence upon the nervous system. Turpentine and its congeners have tonic and stimulating properties in addition to their antiseptic influence, and drugs like salol probably control pain, not only by acting upon the fluids circulating in the bloodvessels and lymphatics, but also by directly influencing the brain and nervous system. I think turpentine and salol are two valuable drugs, if given in moderate quantities and with care that the turpentine shall not be pushed to the point of producing strangury, and that the salol shall not be pushed to the point of producing carbolic-acid intoxication. In certain conditions I think morphin may be used, and should be used, without hesitation. But these circumstances are rare. The bromids (and I prefer sodium bromid) are useful as occasional remedies. So is sulfonal, and so is trional, to control restlessness and to secure sleep, in the absence of pain, on which they have no effect whatever. Phenacetin is also useful with a view to controlling nervous irritability, bearing in mind its effect in producing perspiration. I believe that at times pepsin-solutions, with dilute hydrochloric acid added, are useful as an aid to digestion and the natural processes in the intestines, and not as medicine.

My view in regard to alcoholic stimulants is that they are seldom required, and never in the large quantities sometimes prescribed. There are times when a dose of a teaspoonful of whiskey in a little hot water, repeated every ten minutes, may tide over a short period of weakness or collapse; but I think the administration of such quantities as eight or sixteen fluidounces of whiskey in twenty-four hours is not good practice; while I believe that hot tea or coffee, without cream or milk, may be used instead of the smaller quantities of alcohol just mentioned.

I have not attempted to describe in detail the mode of treating typhoid fever, but only to state the general principles which impress themselves upon me as correct after a reasonable experience. These are, as stated: 1, careful maintenance of the natural processes of excretion; 2, the judicious administration of food; 3, moderate regulation of temperature; 4, medication reduced to the lowest possible point. My object in discussing the subject at this time is not so much to present my own opinions as to put them in evidence in order to strengthen the hands of those who have recently

contended for what I believe is the rational mode of treating this very serious disease.

## THE NATURE AND MANAGEMENT OF FUNCTIONAL GASTRIC DISORDERS.[1]

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IT is said that things are known when understood and understood when interpreted. Concerning the familiar symptom-complex embraced under the term functional gastric disturbances there is much lack of agreement in interpretation, and, therefore, it is concluded that there exists disagreement as to the nature of the pathology in question.

A recent American writer has arrayed these symptoms to explain them as the result of subacute gastritis. One Continental observer attributes the phenomena to an on-coming gastrectasis, and another easily divides the group into a series of special stomach-diseases in which hyperchlorhydria stands forth prominently. Ewald, Rosenheim, and Boas separate the disturbances into irritative forms and depressive forms, and then assign to each abnormalities in motion, secretion or sensation.

Unquestionably there is functional disturbance of the organ in subacute gastritis, and the same holds true of beginning gastrectasis; also there are types that are sufficiently distinct to admit of their description as varieties, and an analysis of these varieties, after the fashion of Ewald and others, leads to a clearer understanding of the nature of gastric neuroses; and yet it would appear as though the subject were open to still another interpretation of which in part it is the purpose of this brief paper to speak.

In the first place, let it be said that the functional gastric disorder is very rarely a primary trouble. In reviewing the records of a series, including between five hundred and six hundred cases of supposed stomach-disease, in which at least one complete examination of the gastric contents was made, in not one instance can it be said that functional trouble indubitably arose from a disturbance that was primarily gastric.

This is not impeaching the possibility of such occurrence. It can be readily seen how overtaxing the stomach alone might eventually induce exhaustion and a consequent seated neurosis. Indeed, perhaps nothing is more important, as a contributing factor, than gluttony; but in point of fact one rarely finds gluttony the essential cause of the neurosis. Something has gone before, or something accompanies the pernicious habit of over-indulgence, and as a joint result we discover the neurosis. It is remarkable that the stomach will tolerate patiently so many insults of a dietetic character, both in food and in drink. True, a subacute gastritis may result, but under a diminished appetite it soon subsides, and no functional disorder follows.

Of course, this statement may be met by quoting the freely-admitted fact that it is the everyday experience for physicians to have patients complain of persistent gastric symptoms resulting from injudicious eating. Quite true. A failing gastric function is usually first made manifest by the overtaxing of that function; but even if overtaxed, that function rarely, if ever, remains weak and perverted from the effect of the indiscretion alone. On the contrary, a healthy organism, after a short period of reaction, congestion—if you please, of subacute gastritis—resumes its customary pace. (Note Beaumont's oft-mentioned observations on St. Martin.)

What, then, are the influences that invite the appearance of the persistent functional disorders of the stomach? The question is one that should arise in the physician's mind with every case that is presented. This paper is intended as a protest that the question is not more frequently raised.

In ratio to one's ability to hunt down and remove the causal factor will be his success in relieving the neurosis, failure in which has come to be an opprobrium. The stomach, like a mirror, reflects pretty nearly every influence to which the organism is subjected. Irritation of the brain, the cord, the testicle, the uterus, the kidney, or the liver, results in anorexia, or perhaps vomiting. Grief, joy, worry, and pain, lead to similar results. When there is toxemia from constipation, or renal or cutaneous insufficiency, or the infections, it is the stomach that raises the alarm. In the cerebral anemia of naupathia, or of a fainting turn, and in the cerebral congestion of sunstroke, the gastric are in the tumultuous front of the anarchistic functions.

One need not go far for explanation of these phenomena. Perhaps no portion of the organism has so complex a sympathetic nerve-supply as the stomach. Robert Ewald's extraordinary exposition of this truth, in his brother's masterly book on diseases of the stomach, is entitled to mention on all occasions. Just why Nature has provided this curious arrangement it would be interesting, but at this time extraneous, to discuss. Enough to say that it exists. Now, of those suffering from these various irritations, any of which, either through toxemia or reflex disturbances, may lead to the gastric symptoms, and if the stomach-contents were examined there would be found no evidence of subacute gastritis, none of the "ropy mucus" that inexperienced men so much talk and write about, and which those who have largely studied gastric contents usually fail to discover; but there would be found testimony that

[1] Read before the New York Academy of Medicine, May 17, 1894.

there had occurred a serious derangement in gastric innervation, exhibiting itself to some extent as excitement, to some extent as depression, and in some instances it is impracticable to say that either of these states predominates.

An attempt at the segregation or the classification of these gastric phenomena appears to me as usually inexpedient, if not unsuccessful. They are mixed symptoms resulting from remote disturbances. Undoubtedly a stomach having such faulty and spasmodic innervation would now resent bad diet, or perhaps any other kind of diet, and yet the trouble is not one primarily of the stomach. It is not that the face of the mirror is irregular, but it is because of the distorted figures reflected from it that the picture is hideous.

If these statements are facts, and if they be applied as guides in traversing the maze of functional disorders of the stomach, it would seem as though they would help us to rightly understand the real nature of those affections.

Let any case of undoubted functional gastric disease be put under examination. There may be eructations of gas or sour fluid (that means insufficiency of the cardia, as a rule); there may be an excess of free HCl (that means a faulty inhibition of the peptic glands, probably); there may be uneasiness amounting to gastralgia (that means undue irritation or hyperesthia, one or both). Now, instead of resting content with this diagnosis, admirable and advanced though it may be, and making for himself limitation in therapeutics that are directed toward immediate relief and really nothing else, no matter how successfully they are applied, the physician is asked to look further, having before him the conviction that there is operating an unthought-of cause that has diverted nervous energy from its ordinary courses and is the present malefactor.

Where will the trouble be found? In the search it is convenient to examine for the possible presence of: *First*, some centric or eccentric nerve-irritation acting reflexly; and, *second*, some toxemia. The nerve-irritation may prove to be some central structural disease or persistent circulatory disturbance, or it may follow excessive mental strain, as seen in actors, school-teachers, and those suffering constant interruptions, or it may be, and in fact often is, accounted for by defects in the organs of special sense, particularly the eyes.

One cannot be unmindful of the doubts that this last statement may arouse in the minds of listeners who have given the question of eye-strain large attention, for it is well-known that observers differ widely as to the importance of ocular defects in the development of functional disorders. I have no contention to make, but a faithful record of personal experience to report.

To leave for the present the matter of the brain and its nerves, it will be found that irritation of the cord, either directly, as from pressure in lordosis, scoliosis, and other sources, or interference with innervation, as in tabes or focal myelitis, or indirectly, as in irritation from hysterical spine, is a common source of gastric disorder.

Further than this, the mischief may be lurking in the genito-urinary apparatus. Not alone the uterus and ovaries, but the urethra, the meatus, and the prepuce should be critically examined. A frequent and generally overlooked cause of the disturbance exists in ureteritis, to which attention has been especially directed by Dr. Howard Kelly and by Dr. Matthew D. Mann. Wandering and movable kidney and renal irritation from hyperlithuria belong to the list. It is not intended to catalogue all the known reflex causes of functional disturbance, as the subject is too trite, and perhaps the array is already redundant.

There now remains to be considered the influence of toxemia in the production of gastric disturbances. One of the most common and most important forms results from defects of the kidneys, either dependent upon nephritis or upon functional inadequacy of the organs, a subject fully discussed by Sir Andrew Clark, Casper A. Peyer, and others abroad, and by Rochester and Allen Jones in this country. So alcohol, tobacco, coffee, and other substances may induce digestive disturbance indirectly through the blood and nervous system. Malaria, gout, and tuberculosis often offend in the same manner.

Not to be prolix, there is another potent, and, it is believed, hitherto an undescribed cause of functional gastric disorder doubtless operating through the medium of the blood. Reference is had to the very late phases of syphilis. The patients usually give a history of an ancient infection, with presumably the usual routine of medication. In several there is a history of healthy children. As a rule, there is an absence of the ordinary tertiary lesions, although the skin is usually muddy, and in some there exists a moderate anemia. In the series already mentioned, representing over five hundred cases in which the stomach was minutely studied, there were twelve whose gastric symptoms depended upon late syphilitic toxemia. Only one of these, a gentleman residing in this city, improved upon ordinary treatment. Fully one-half failed to improve after such treatment was faithfully tried, but all of them made immediate, prompt, and lasting improvement when given ascending doses of potassium iodid, and with one exception all have been discharged on no other than syphilitic treatment, the other measures having been abandoned. It is interesting to note that in these cases there occurred but little disturbance in secretion. The complaint

was of sensory and motor symptoms—gas-eructations, nausea, distress after eating, and frequently more or less gastralgia. This account has been somewhat amplified, because the conclusions are believed to be new.

In reviewing the multitudinous causes of functional gastric disorders it would be interesting to analyze with a view of determining whether or not given irritations, particular reflexes, and special forms of toxemia produce uniform and distinct varieties of gastric neuroses. So far as this matter has been studied the answer must be in the main no. However, there is ground for believing that in a few instances with a pronounced given reflex irritation there will probably result functional failure along certain lines. An example may be given, but as a preliminary the belief should be stated that long-continued functional perversion leads invariably to structural change.

Now as to the example:

Your distinguished fellow, Dr. Max Einhorn, in 1893 first described, under the title "Achylia Gastrica," a most important condition of the stomach, that was later described by Dr. Allen Jones as "Gastric Anacidity." Now, of the cases reported by the latter, together with several others included in the series already mentioned, the majority have been examined as to the existence of eye-strain. Without a single exception in the cases thus investigated there has been found to exist a definite, and relatively speaking, uniform ocular defect, viz.: unsymmetrical astigmatism of high degree, varying from one to five diopters. It should be noted that there was an absence of the slight astigmatic faults, such as are reported to be responsible for so much headache. Also, that the present ametropia was irregular, such as myopia in one eye and hyperopia in the other, besides a lack of correspondence in the axes of astigmatism. Obviously no claim is made that these ocular defects are generally followed by "Achylia Gastrica;" but it is true that in every case of this form of gastric trouble in which an eye-examination was made ametropia of the forms described was found present.

Letting repose the eye-question and asking a moment's attention to the stomach-disease under consideration, the opinion is ventured that in "Achylia Gastrica" we have to do with an affection that in the beginning is often a mere functional disturbance. The long-continued inhibition of the peptic glands is succeeded by atrophy, and what is at first an amenable condition terminates in structural change and is persistent. The history of the patient is not one of acute or chronic gastritis, but one of long and troublesome functional derangement. These cases have been followed through the very transitional stages and, as it were, taken *in flagrante delicto*. Here seems to be evidence of the truth of the assertion that long-continued functional disturbance leads to change in structure.

The etiology of most cases of gastrectasis is involved in the history of functional insufficiency. Many believe that peptic ulcer has often a neuropathic origin. It is highly probable, then, that sometimes, as a result of functional disturbance, chronic gastritis may be established. The successful management of functional disorders of the stomach, therefore, includes not only an intelligent special treatment of this condition and correction of the diet, as indicated by the precise study of the stomach and its contents, but also the discovery and removal of the cause, and that cause is frequently remote from the organ in question.

To recapitulate it is held that:

1. Functional gastric disorders generally arise from influences outside the stomach.

2. Those causes are usually to be found in some reflex irritation or some toxemia.

3. Amongst the latter syphilis occasionally has a place that apparently has passed unnoticed.

4. Structural changes in the stomach are not so much the causes as they are the results of functional disorders.

5. The successful treatment of these affections must include the removal of the often unsuspected exciting cause.

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## THE TREATMNT OF TUBERCULOSIS WITH YEAST-NUCLEIN.

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I CLOSED my paper on "The Nucleins and Nuclein-therapy," read before the Michigan State Medical Society last May, with the following paragraph: "I have been using nuclein in the treatment of tuberculosis in man since the 1st of May, 1893. At first I employed only yeast-nuclein, but now now I am using spleen-nuclein in some cases. When sufficient evidence has been obtained, either to reject or to recommend the treatment, the results will be communicated to the profession. I may say, however, that only in initial cases may we expect any benefit, and even in regard to these I must have more abundant material and a longer experience before I can speak with any certainty."

Since the reading of the paper mentioned several articles on nuclein and nucleinic acid have appeared, and Professor Kossel, of the University of Berlin, has applied for and has received in Germany a patent on a process of manufacturing nucleinic acid.

In this paper I shall deal only with my own observations and experiments, and, in order that my statements may be properly connected with those

that I have previously made, I repeat the most important conclusions that I have reached and stated in preceding papers. These are as follows:

1. The nucleins and nucleinic acid are powerful germicides. This was first shown in a paper by McClintock, Novy, and myself, published in THE MEDICAL NEWS of May 20, 1893. Additional facts on this point were given in my address before the Medical Section of the Pan-American Medical Congress and published in THE MEDICAL NEWS of October 7, 1893. This work was confirmed in a paper published by Kossel in February, 1894.

2. The germicidal constituent of the serum of blood is a nuclein. This was shown in a paper by McClintock and myself, read at the Pan-American Congress and published in THE MEDICAL NEWS of December 25, 1893.

3. Rabbits and guinea-pigs may be protected against virulent cultures of the diplococcus of pneumonia by previous treatment with hypodermic injections of a solution of yeast-nuclein.

4. The immunity thus secured is not due to the action of the nuclein as a germicide directly.

5. The process of securing this immunity is an educational one, and most probably depends upon the stimulating effect of the nuclein upon some organ whose function it is to protect the body against bacterial invasion.

6. The longer the nuclein-injections are continued and the more frequently they are administered, the more complete is the immunity secured.

7. In order to obtain this immunity, the inoculation with the germ must follow soon after the last treatment with the nuclein.

8. Attempts to render guinea-pigs immune to tuberculosis by the methods so far employed show that previous treatments with nuclein retard, but in the majority of cases do not prevent, the development of tuberculosis from subsequent inoculations.

9. Attempts to arrest tuberculosis already developed in guinea-pigs, by treatment with solutions of yeast-nuclein, have been followed by varying results, depending upon the virulence of the germs used in inducing the disease, the stage of the disease when the treatment is begun, and the susceptibility of the animal, especially as influenced by age. Upon this point we have bestowed much time and labor, but the results have been so conflicting that I am not yet prepared to formulate any positive conclusions. I have in my note-book details of experiments upon more than one-hundred pigs, and I feel that I am as little able to speak positively on the subject as I was when the experiments were begun.

10. I have used nuclein with benefit in the treatment of indolent ulcer, tonsillitis, and streptococcus diphtheria.

The preceding condensed statements bring us to the publication of my last paper on the nucleins, *i. e.*, the one read before the Michigan State Medical Society and published in the *Transactions* for 1894.

Taking up the work at this point, I wish to detail work done upon two other points before I proceed to discuss the results which I have obtained in the treatment of tuberculosis in man with yeast-nuclein.

### IMMUNIZING RABBITS TO TUBERCULOSIS.

On March 19, 1894, I inoculated rabbits 1, 2, 3, 4, 5, 6, *a* and *b*, with a virulent culture of the bacillus. Animals from 1 to 6 inclusive had had previous treatments with a one per cent. solution of yeast nucleinic acid, as follows:

| March | 9, | 10, | 13, | 14, | 15, | 16, | 17, | 19 |
|---|---|---|---|---|---|---|---|---|
| Amt. of sol. in c.c. | 0.3 | 0.5 | 0.6 | 0.7 | 1 | 1 | 1 | 1 |

*a* and *b* had had no nuclein. All of the animals were half-grown, and weighed respectively: No. 1, 714 grams; No. 2, 724; No. 3, 740; No. 4, 729; No. 5, 647; No. 6, 614; *a*, 709; *b*, 705. On July 6, 1894, I killed No. 6, *a* and *b*. No. 6 weighed at this time 1557. I found a nodule the size of a pea at the point of inoculation. In all other respects this animal was normal. I could find no bacilli in the nodule, which was rubbed up with beef-tea and injected into the abdominal cavity of guinea-pig No. 186, weighing 385 grams. On October 10, 1894, I killed this pig, and I found a nodule the size of a pea at the point of inoculation. Three small tubercles were found in the peritoneum; the omentum and liver were filled with tuberculous nodules. One testicle was tuberculous.

This is an interesting case, showing that the germ, which had not spread in the rabbit, had, when transferred to the more susceptible pig, induced a widespread tuberculosis.

Pig *a* weighed 1030, and *b* 1100 grams. In both nodules as large as filberts were found at the point of inoculation, and smaller nodules in the omentum. On October 10th I killed No. 1, weight 2134. This animal was found to be wholly free from tuberculosis. On October 4th I killed No. 2, weight 2150, which was found perfectly normal. No. 3 was found dead October 2. Post-mortem examination showed a pear-shaped tumor in the omentum. This tumor was three inches long and one-and-a-half inches in diameter at the base. It consisted of three cysts, which contained very fetid pus, in which were found a short bacillus and a large micrococcus. There was no evidence of tuberculosis. No. 4 was killed October 10th, weight 1990. I found a small nodule at the point of inoculation. This was not attached to the abdominal wall, but was in the connective tissue, between the skin and the muscle. I could find no germ. In all other respects this rabbit was normal. No. 5 was killed October 10th, weight 2000, and found perfectly normal.

These experiments indicate that rabbits may be rendered immune to tuberculosis by previous treatments with yeast nucleinic acid.

THE TREATMENT OF RABBITS WITH NUCLEIN.

On May 26, 1894, I inoculated rabbits 1, 2, and *a*, intra-abdominally with a pure culture of the bacillus tuberculosis. Their respective weights were 657, 685, and 547 grams. Nos. 1 and 2 had daily, from May 28th to July 3d, 0.5 c.c. of a 1 per cent. solution of yeast-nucleinic acid; *a* had no treatment. No. 1 was killed October 11, 1894, weight 1390, and found normal in every respect. No. 2 was killed October 11th, weight 1530, and was found perfectly normal. Pig *a* was killed October 11th, weight 990 grams. A nodule as large as a filbert was found in the peritoneum at the point of inoculation. There were many millet-seed nodules in the peritoneum and omentum, one in the left kidney, two on the walls of the abdominal aorta opposite the left kidney, several on the peritoneal covering of the greater curvature of the stomach, a tuberculous mass on the smaller curvature of the stomach, and the liver was dotted with pin-point nodules.

June 8, 1894, I inoculated intra-abdominally rabbits 1, 2, 3, 4, 5, 6, 7, and *a* and *b* with a pure culture of the bacillus tuberculosis. These animals were only a few weeks old, and their respective weights were respectively 365, 335, 327, 405, 415, 430, 385, 350 and 375 grams. No. 1 had daily,[1] from June 11th to September 25th, 0.5 c.c. of ½ per cent. of yeast nucleinic acid.

These experiments convince me that when the treatment is begun within three or four days after the inoculation, the development of tuberculosis in rabbits may be prevented by yeast-nucleinic acid. These experiments will be repeated, and the length of time between the inoculation and the beginning of the treatment will be increased.

[1] The statement that these treatments were given daily needs some modification. My assistant, Mr. Perkins, who administered these treatments, gave up his vacation to the work, and, had it not been for his untiring perseverance and sacrifice of time and labor, I could not make this report. But he could not attend to this every day, and during the time mentioned there were eighteen days in which no treatmeut was given. No. 1, now weighing 1337, was killed October 5. Examination showed no abnormality. Nos. 2, 3, 4, 5, 6 and 7, having had the same treatment as No. 1, were also killed October 4. Their respective weights were 1400, 1410, 1295, 1425, and 1395 grams. No. 2 had coccidia in the liver, but no tuberculosis. No. 3 was normal. No. 4 had a millet-seed tubercle in the right inguinal region. This contained bacilli. No other abnormality could be found. No. 5 had a millet-seed nodule in the omentum, in which no germs could be found. Otherwise it is normal. No. 6 had coccidia in the liver, and one pin-head tubercle in the omentum, in which no germs could be found. Otherwise it was normal. No. 7 was normal in every respect.

Pigs *a* and *b* were killed October 5, their respective weights being 1488 and 1320 grams; *a* had a tuberculous nodule as large as a cherry-seed at the point of inoculation, and numerous smaller ones in both the greater and the smaller omentum. The liver contained several nodules as large as split peas, and a few were found in the diaphragm. The right kidney was tuberculous. *b* showed diffuse tuberculosis in the abdomiual walls for one-half inch around the point of inoculation. There were two nodules in the omentum, and the liver was thickly dotted with pin-point tubercles. The other organs were normal.

YEAST NUCLEINIC ACID IN TUBERCULOSIS IN MAN.

In reporting my observations on this point, I am beset with certain difficulties. In the first place, the solutions used during the first six months were by no means free from other proteid material, and the exact amount of nucleinic acid in them was not known. In the second place, I had an idea in the first part of my work that the efficiency of the nucleinic acid would be increased by administering it in a strongly alkaline solution. This idea was founded upon the experiments of Fodor, who has shown that certain animals are rendered partially immune to anthrax by increasing the alkalinity of the blood. However, a condition may be protective to an animal against one disease, and without influence, or even detrimental, in another disease. McClintock has recently made one series of experiments in which a number of tuberculous guinea-pigs were treated with hypodermic injections of a solution of sodium carbonate, while others inoculated at the same time with the same sputum were left without any treatment whatever. The results showed not only that the treated animals died before the untreated ones, but the treated ones showed a much more extensive tuberculosis than we have ever before observed in animals dying from inoculation-tuberculosis. These experiments will be repeated, and should the results be confirmed we must conclude that the administration of an alkali diminished rather than increased the efficiency of the nuclein-treatment.

In the cases most recently treated I have, of course, attended to many details that I have ascertained to be important, and of which I was formerly ignorant. Moreover, I have improved the preparation of the nuclein. I also now refuse to employ the remedy in advanced cases in which I know it can be of no service. By carefully examining the sputum of every person who comes to me with a cough, and by testing every sample of urine that contains any pus or blood for the bacillus, I have detected the presence of the disease in its earlier stages. Consequently, the results obtained during the past twelve months have been more satisfactory than those of the earlier months.

(To be concluded.)

***Hypertrophic Cirrhosis of the Liver in a Boy of Fourteen.***—MIRINESCU (*Rev. des Maladies de l'Enfance*, October, 1894, p. 560) has reported the case of a boy, fourteen years old, who had drunk considerable quantities of alcohol, and had also been exposed to malarial fever, and who presented enlargement of the liver and of the spleen, with peritoneal effusion, pronounced icterus, and enlargement of the veins of the abdomen. There was an absence of actual symptoms of alcoholism, and the condition was diagnosticated as hypertrophic cirrhosis of the liver, and ascribed to chronic malarial intoxication.

## DEPURATION AS A THERAPEUTIC PRINCIPLE IN THE TREATMENT OF NERVOUS AND OTHER AFFECTIONS.

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THE publication of *Armstrong on Purgatives* early in this century made a deep impression on the medical practice of the time, and its influence may still be traced in such phrases as "unloading the chylopoietic viscera," "changing the secretions," etc. The principle of depuration, as well as of derivation, was then distinctly recognized, but in our day physicians have been so occupied with the results of chemic and biologic research as to be hardly sufficiently mindful of the great truth embodied in this phrase. It is the purpose of this paper to show the importance in therapeutics of this principle.

First, as to the method: It consists in the exhibition of remedies acting on the organs of excretion, to secure elimination of accumulated waste products, and of various poisons, organic and inorganic, produced in or finding admission to the human body. The remedial measures in question are full doses of the iodids carried to the point of saturation, of pilocarpin in sufficient doses to set up its physiologic actions on the glandular apparatus of the whole internal and external integuments, and of purgatives and diuretics according to circumstances. The combined effect of these remedies is to set in motion the organs concerned in elimination and excretion. We know that the iodids form soluble combinations with the metals, which are then reabsorbed into the circulation and eliminated. We know that pilocarpin secures the excretion of waste products through the glands of the skin and mucous membrane. It is within every one's knowledge that suitable purgatives and cholagogues procure the expulsion of the complex products of intestinal fermentations, and also, by means of salines and diuretics, we can increase the functional activity of the kidneys, and thus effect the elimination of the waste materials of tissue-metamorphosis.

Second, as to the conditions requiring the depurative method: It is an indisputable fact that numerous and subtile influences of a pathogenic kind, only in part ascertained or even suspected, affect every individual in these days. Morbid states are produced not only by minute organisms, but many mineral and vegetable poisons are formed by various processes in the arts, and supplied through the agency of the conveniences of life. Metals, especially lead, zinc, copper, tin, etc., are much employed in the conveyance of water and in culinary operations, and, although their grosser effects are recognizable, they sometimes cause remote and unexpected changes that elude our means of investigation. Volatile metals are cast into our atmosphere by manufacturing establishments, and metals are deposited in the tissues in insoluble forms in the course of medical treatment, and the results are equally obscure. Gaseous poisons formed by animal and vegetable decomposition are freely inhaled with the air, and minutely divided solids find access to the system in the same manner.[1] Ptomains are generated in the intestinal canal, and organic poisons, the products of the physiologic activity of pathogenic organisms, are formed there also in quantity. Other sources of possible contamination might be mentioned, but these must serve our purpose, which is merely to indicate the fact that depurative treatment has its reason in some obvious conditions, and in others that are supposititious merely, yet probable.

According to the plan here suggested, we prepar the way for the curative action of our remedies, and sometimes, indeed, obtain immediate curative results. To illustrate the manner in which the method acts, the case of syphiloma of the brain may be cited. The routine treatment of gummata, as all the world knows, consists in the exhibition of massive doses of the iodids and mercurials; but it sometimes happens that the best-directed efforts fail, we may suppose, for lack of preliminary or contemporary depuration. Not long since I saw in consultation a case of gummata at the base, with the well-known signs of interference with the cranial nerves, and epileptiform seizures, in which, notwithstanding the usual remedies had been diligently applied, they did not produce the expected results, but soon yielded when pilocarpin was simultaneously administered. The abundant perspiration diminished the intracranial pressure, and the increased excretion of the organs concerned in this function brought about absorption of the products of the specific inflammation. The action of pilocarpin may be regarded as a substitute for the decoctions and the baths, so long held to be of sovereign efficacy in these affections. By means of it we can readily obtain that eliminant action which was formerly supposed to be excited only by measures of a complicated and troublesome character.

To illustrate the character and success of the depurative method in question, I submit some cases treated in this way.

A gentleman of sixty-four years began to have the evidences of a commencing hemiplegia of the left side, with some sensory disturbance of the right. He is of fine physique, weighs 180 pounds, is active in his habits, and free from the usual vices,

[1] A few years ago there was found in the air of this city dust derived from the destruction of an island in the Pacific by an earthquake.

except that he smokes rather too much. For several months he had felt himself declining in strength, became unable to walk, lost his breath on slight exertion, experienced a good deal of headache, and hebetude and uncertainty of mind.

On objective examination the following symptoms were developed: An evident paresis of the muscles of the left side of the face, the labio-nasal fold being nearly obliterated on that side; the upper and lower extremities of the left side were weak, the reflexes rather heightened, and the senses of touch, pain, and temperature were less active than the normal; on the right side he experienced some sensory disorders; the tongue was protruded to the right, and there was some tingling of the tip of the tongue and of the lips; speech was slow and somewhat thick; the pupils were sluggish; hearing was dull; respiration was labored on even slight exertion; the action of the heart was weak and the sounds reduplicated; appetite was indifferent and digestion labored; he was constipated; the urine contained 0.5 per cent. of albumin, and was rather diminished in amount. The point of chief concern was the condition of his mind. His faculties had become somewhat clouded and he had experienced great difficulty in writing a letter, making wrong use of words and omitting words, so that he had been compelled to give up his correspondence.

In considering the case with a view to a therapeutic diagnosis, the character of the changes in the organic substratum seemed rather obscure. The nature of the etiologic factors was also not readily determined. There had been no rupture of an intracranial vessel and hemorrhage; there were no signs of an embolus, and little evidence of arterial degeneration, although capillary thrombosis from endarteritis might be suspected. There were signs, however, of insufficient excretion, of accumulation of waste products, for, notwithstanding the predominant symptoms were unilateral, there were some bilateral, showing that the causative conditions were general in operation also. The most obvious necessity was to put in action the various organs of elimination. Accordingly I prescribed scruple-doses of sodium iodid four times a day until iodism appeared, and pilocarpin hydrochlorate, ⅙ grain, every night, to be increased if necessary till free diaphoresis occurred. A mercurial purgative began the treatment. But few doses had been taken when the conjunctiva became inflamed and an acute laryngeal catarrh was set up, and all of the usual symptoms of iodism came on energetically. The pilocarpin acted with the same severity. The result was admirable, and a few days disposed of the formidable morbid complex, and full restoration to the normal ensued, and has been since maintained.

To demonstrate the utility of the depurative method in other than nervous maladies, I will cite a case in which the gastro-intestinal mucous membrane, the stomach and liver were affected simultaneously.

A gentleman aged about thirty-five years, employed in a bank and closely confined to business, began to suffer from digestive disorders. He was a small, spare man, weighing in full health not more than 140 pounds, and he progressively declined in flesh and strength, was compelled to quit business, and presently was confined to his bed, being reduced when at the lowest point to 94 pounds. He had severe pain at the cardia and much distress after taking food. Nausea, and vomiting of almost every article swallowed ensued. There was no vomiting of blood; the matters brought up had an acid reaction, and no blood-globules could be found on the most careful examination. He was obstinately constipated. At one time he became jaundiced. The blood became so altered that it flowed from the mucous surfaces, especially from the nasal, and plugging became necessary at last to prevent death from hemorrhage. He was now reduced almost to the lowest point compatible with life. The physician in attendance, a most skilful man, had exhausted every resource in his efforts to stay the progress of the disease. When called in consultation it seemed to me futile to suggest remedies of approved utility in gastro-intestinal disorders, and recognizing the need in this direction, I advised a resort to depuration. The doctor gave ⅙ grain of pilocarpin to begin this plan of medication. The action was striking. Every organ—the skin, the mucous membrane of the gastro-intestinal canal, the salivary glands of the mouth, and we may reasonably conjecture the pancreas, and certainly the liver—took on most abundant activity. The saliva flowed in a stream, he sweated profusely, and the bowels moved copiously, the discharges having the so-called "bilious" character. No depression followed this free elimination; on the contrary, immediate improvement took place, and he had no more hemorrhage. The effects of the pilocarpin were sustained by the exhibition of 15-grain doses of iodid. It might be supposed that in a case characterized by such extreme irritability of the stomach, a remedy of this kind would be badly, or not at all, borne by the stomach. The result, however, demonstrated the utility of the treatment, for the patient made great immediate progress, and although there have been occasional relapses, he has since continued to improve in nutrition, and is now practically well.

Other examples might be brought forward to show the application of the principle to the treatment of diverse affections, and the two already given might have been described in fuller detail; but these must suffice for the present. My purpose is subserved by calling attention to the method, which may profitably become a routine-habit in many cases whose etiologic relations are of a kind to suggest it.

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***The Value of State Medical Examinations.***—From the organization of the Maryland Board of Medical Examiners, in June, 1892, until November, 1894, 130 candidates for license to practice have been examined, of whom 102 were successful upon the first examination and 3 upon a second examination; the remaining 25 that failed to pass the first examination did not apply a second time, and were rejected.

## SELF-RETAINING DRAINAGE-TUBE AFTER SUPRAPUBIC CYSTOTOMY FOR CHRONIC CYSTITIS AND PROSTATIC OBSTRUCTION.

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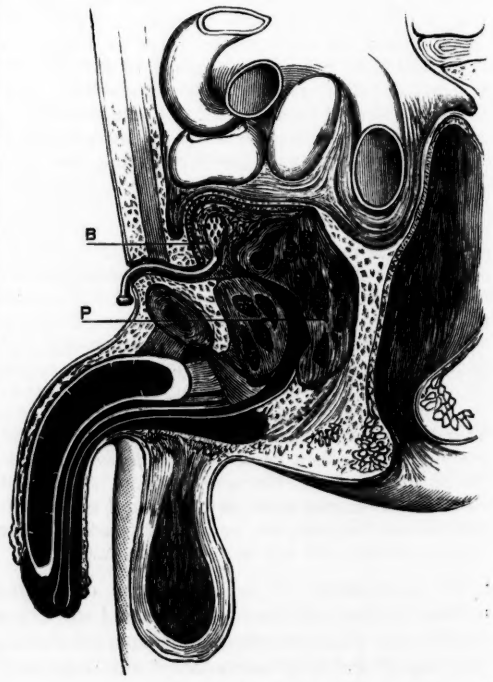
THE formation of a permanent suprapubic fistula in the treatment of hypertrophy of the prostate gland complicated by cystitis has become a recognized surgical procedure. It is an operation which not only affords prompt relief after all other methods of treatment have failed, but is also calculated to prolong life by preventing further extension of the inflammatory process in the direction of the kidneys. Contrary to the experience of other surgeons, notably Dr. Hunter McGuire, I have found it very difficult to keep the suprapubic fistula sufficiently patent for any length of time without a resort to some form of drainage-tube. I have almost invariably observed that as soon as the drainage-tube is dispensed with the fistulous opening contracts rapidly, and in a few days it has to be dilated in order to afford a free outlet for the urine.

Systematic catheterization of the new passage has proved very unsatisfactory in my experience in all cases in which this part of the treatment was intrusted to the patient. I have resorted to the use of various kinds of drainage-tubes devised and described by different surgeons from time to time, with similar unsatisfactory results.

It is difficult to maintain the necessary degree of patency of the new outlet for the bladder with any kind of a soft-rubber tube. The tubes made of metal, or of hard rubber, used for the same purpose, are likely to produce pain and harmful pressure at the neck of the bladder. The neck of the bladder is the most sensitive part of the viscus, particularly when the bladder is in a condition of inflammation in consequence of chronic prostatic obstruction. A drain that has to be employed for a long time, or permanently, should not press against the swollen sensitive prostate or inflamed neck of the bladder. For the purpose of rendering the drain self-retaining, and with a view of preventing painful pressure, I have devised the instrument shown in Fig. 1. The instrument is made of silver; the bulbous end has a large round terminal, with numerous smaller oval, lateral openings, and when in place, corresponds with the long axis of the bladder. The adjoining elbow shows two lateral and one posterior oval opening, which are intended to drain the space above and behind the enlarged prostate. The straight part of the instrument between the two elbows should correspond in length with the thickness of the tissues above the pubes, interposed between the skin and mucous membrane of the bladder. The part below the second elbow terminates in a raised margin over which a piece of rubber tubing is slipped. An ordinary clamp fastened to the end of the rubber tube prevents the constant escape of urine, and is made use of as soon as continuous drainage has became superfluous and the patient is able to leave his bed. The instrument when in place (Fig. 2) drains the bladder perfectly,

FIG. 1.

FIG. 2.



makes no pressure against the prostate or neck of the bladder, and is self-retaining. It can be removed and reinserted with ease. I have recently performed suprapubic cystotomy in three cases of enlarged prostate in men from sixty-five to seventy-two years of age, complicated by chronic cystitis, and in two of the cases by stone in the bladder, and in every instance prompt relief was obtained. All of the patients made the statement that they were never aware of the presence of the tube. The tube should be removed at least once a week, and be thoroughly cleansed of all internal and external incrustations and at once replaced. The bladder can be thoroughly washed out by injections *per urethram*. With a little instruction and practice the patient soon acquires the necessary manual dexterity and skill to remove and reinsert the tube himself. As long as prostatectomy either by the urethral, perineal or vesical route remains such a dangerous and unsatisfactory operation as it is at the present time, any improvement in the formation of a permanent suprapubic fistula will be appreciated by surgeons who are frequently appealed to for relief by a large class of patients whose declining years are clouded and rendered miserable by one of the most distressing of all surgical affections.

## ON THE VALUE TO THE SURGEON OF ANTIPYRIN, OF MUSTARD AND SUGAR, AND ON THE PREPARATION OF CERTAIN SURGICAL DRESSINGS.

BY ROSWELL PARK, A.M., M.D.,
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DURING the winter of 1885 my attention was called to an article by someone whose name I do not now remember, stating that he had found a solution of antipyrin to be an efficient hemostatic in the treatment of urethral hemorrhage. This statement was made to me by a visitor at one of my clinics at a time when I was in need of something that might act in this way. Accordingly, I at once made a 4 per cent. solution, tested it for this purpose, and found it very satisfactory. This was my first introduction to antipyrin as a hemostatic. Charmed with the result thus produced, I at once began experimenting with it in a variety of surgical cases. Having learned, in one way and another, that it was a most efficient and practically harmless styptic, I desired to ascertain whether it was one that could be safely used inside of the body-cavities, and whether it had any antiseptic properties. I tested it carefully in my own laboratory, and learned, by repeated experiments, that while not a strong antiseptic it, nevertheless, had marked antiseptic properties, holding its own fairly well with many of the other synthetic productions that have of late been so freely placed upon the market for this purpose. It compares, indeed, very favorably in this respect with most of the anilin or coal-tar derivatives that we use in medicine. I then began experimenting upon animals, or, rather, using the drug during various experiments, employing for this purpose a 4 per cent. or 5 per cent. solution in sterilized water. I soon learned that this could be used anywhere upon the peritoneum, upon the bowel, upon the brain-surface, or anywhere else, invariably exhibiting its styptic properties and causing no symptoms that lead me to regret its use. Thus fortified, I began its general use in aseptic surgery. Now I keep a standard solution in my clinic, where I always have fifteen or twenty pounds of air-pressure ready to be used for spraying, and small hand-sprays, which, with this-air pressure, are conveniently at hand for any emergency. I have never hesitated to spray a 5-per cent. solution on an exposed and oozing surface, whether this were on the cortex of the brain, in the nose or mouth, in the peritoneal cavity, upon injured liver or bowel, or anywhere else.

I have found that antipyrin has power not sufficient to contract vessels of any size that spurt, but to almost instantly blanch and check oozing from any surface from which blood is escaping just fast enough to be an annoyance. I have hundreds of times demonstrated this efficiency in my clinic, and at various times, when visiting other operators, have been able to make the same demonstrations for them. As a consequence, a number of my surgical friends are now using this remedy for this purpose. It may be injected into a cavity, as in bone; it may be applied on compresses to the oozing surface, or it may be sprayed as mentioned; but no matter how applied, under circumstances indicated within the limits given, it will seldom, if ever, be found to disappoint.

I think it essential to say that I have thus tested it bacteriologically, because some might otherwise hesitate to use it. My own preference for operating is, whenever possible, by the dry method, and in many cases, unless something is positively indicated, I let nothing come in contact with the fresh wound-surfaces—neither antiseptic solution nor anything save sterilized compresses. Upon such a surface, however, if necessary I would not hesitate to employ a sterilized solution of antipyrin, believing that it is sufficiently antiseptic to be left without feeling that one must remove every particle of the solution. Moreover, it is practically unirritating, since I have never known harm to occur from its entrance into any part of the body where it was not called for. I should have no fear, for instance, if a little of the solution trickled down into the peritoneal cavity after it had been applied to the surface.

Antipyrin has this great advantage over such styptics as the salts of iron, in that it constringes the minute vessels and does not leave any external clot in the way, or that may break down, or that in any sense shall be undesirable, as are the clots, for instance, made by Monsell's solution. In cases of epistaxis, for example, a solution of antipyrin may be sprayed into the nose with the greatest benefit. It will serve a most admirable purpose after intranasal operations, as I have many times convinced myself. In the urethra, as after internal urethrotomy, it will have the same beneficial effect. In certain operations on the mouth I have had patients occasionally gargle a weak solution, or have inserted tampons saturated with a solution of antipyrin to which a little glycerin has been added. Up to the present I never have known any unpleasant result from its use in any part of the body in solutions not exceeding 5 per cent. for the purposes stated. Sometimes, in fact, I have used solutions as strong as 10 per cent.

This leads me to speak of certain other purposes for which a 4 per cent. or a 5 per cent. solution of antipyrin may be locally used. In 1888 I mentioned to my friend Professor Hinkel, of this city, the relief that I had found antipyrin to afford in certain cases of inflammatory occlusion of the nose, as well as its hemostatic virtues. He began using it, was much pleased with its effects, and wrote an elaborate article entitled "Clinical Notes Upon the Use of Antipyrin in the Nasal Passages," which was published in the *New York Medical Journal* for October 28, 1888. I speak of this particularly, because quite recently I have seen an article, emanating from New York, claiming originality for this discovery, the author apparently being quite unmindful of the article published by Dr. Hinkel some years previously.

When antipyrin is to be used for any medicinal purpose necessitated by affections of the head, as, for instance, headache, coryza, etc., there is no way by which its effects are so speedily gained with so little disturbance and so little danger, as by spraying it into the nose. It must be acknowledged that these solutions give rise to some temporary smarting and irritation of the mucous membranes, and my custom is first to spray in a weak solution of cocain and to follow it in a few moments with the antipyrin. At other times the two may be combined. The effect of the cocain is not merely to anesthetize the surface, but to constringe the vessels, this effect, however, quickly passing away. The effect of the antipyrin seems to be to carry out to a much more marked degree the conditions thus produced by the cocain, the constringing of the tissues lasting sometimes for several hours, which would not be the case when cocain alone is used. For "that stuffy feeling" of which many patients speak, complaining of a catarrhal condition of the upper air-passages, accompanied by a certain amount of discomfort or actual pain in the anterior part of the head, there is nothing in my experience that begins to afford so speedy relief. For my own part, if I ever have to resort to antipyrin to gain relief from headache, I should prefer to use it locally rather than to take it internally. The quantity required is much less, which of itself is an important item, while the effect produced is manifested very much more quickly. The same is true also of certain acute affections of the throat; and the discomfort attending an ordinary attack of pharyngitis, with the soreness radiating into the neck and head, can be more quickly relieved by this spray than by any other measure that I know of. Of course, I do not mean to imply that this solution will be all-sufficient. Other and more general measures are called for at the same time; but I maintain from a quite extensive experience with the drug that it will give early relief more satisfactorily than anything else of which I have knowledge.

Undoubtedly, the effects, either styptic or analgesic, that I have eulogized are due to the same constringing effect upon the tissues of the body. Antipyrin in its local effects is generally astringent, but that it has these properties comparatively few are yet aware, and this therapeutic note is written with the view of enabling others to take advantage of a very valuable fact.

(To be concluded.)

## CASTRATION FOR THE CURE OF HYPERTROPHIED PROSTATE.

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THE reception by the medical profession here and elsewhere of the suggestion made by me in June, 1893, that castration might be an effectual remedy for prostatic hypertrophy has been increasingly favorable. Up to that time no reference existed in surgical literature to the possibility of affecting the overgrowth by the removal of the testes. Since then twelve more or less successful cases have been published. It is not too much to say that, in connection with the further corroborative evidence that has been brought forward, they serve to establish the operation as a rational and justifiable procedure. I have already reviewed in THE MEDICAL NEWS (June 2, 1894) the history of eight of these cases (Haynes, 3; Smith, 1; Ramm, 2; Powell, 1; White, 1). The other four may be briefly summarized as follows:

Mayer and Haenel (*Centralblatt für die Krankheiten der Harn- und Sexual-organe*, August 23, 1894) operated May 16, 1894, on a man, about

seventy years of age, with a much enlarged prostate, with cystitis and ammoniacal urine, tenesmus and toxemia, and in whom catheterism was becoming impossible on account of the pain it excited. There were several ounces of residual urine. Some improvement was noted in a few days; after two weeks the tonicity of the bladder began to return; in three weeks the urine was nearly normal; and in six weeks the prostate had shrunk to its proper dimensions, the bladder emptied itself completely, no catheter being required, urination was performed only once in four hours, and the urine was limpid and of acid reaction.

The authors discuss the apparent analogy between the prostatic and the uterine fibro-myomata (which was what led me to the researches that resulted in my suggesting the operation to the profession), mention my confirmatory experiments on dogs (which gave a definite and scientific basis for the suggestion), and after quoting Ramm's cases arrive at conclusions entirely favorable to the method, on account of its comparative safety and the ease of its performance, as contrasted with the other operative measures directed against the hypertrophied prostate.

Moullin (*The Medical Press and Circular*, September 19, 1894) reported the case of a man, about eighty-one years of age, with complete retention due to a prostatic enlargement the size of an orange, with cystitis and failure of general health, and in whom catheterization was impossible, all attempts being followed by hemorrhage. Supra-pubic aspiration was necessary on several occasions.

After the castration the improvement was almost immediate, the prostate was appreciably smaller in ten days, and in three weeks had practically disappeared. An ordinary catheter could be readily passed. The bladder had begun to regain power. The urine was nearly normal.

J. I. Thomas (*The Pittsburg Medical Review*, September, 1894) reports a case in which castration in a patient of sixty-five years, who had had symptoms of prostatic hypertrophy for fifteen years, had caused "considerable improvement." He adds, "urination, which was formerly very frequent, is now necessary but three times a day." This report was made very soon after the operation, and no further details are given.

B. M. Ricketts, of Cincinnati, reports (*Cincinnati Lancet-Clinic*, December 1, 1894) a case in which he did this operation in a patient, about seventy-four years old, who left the hospital at the end of the sixth day. On the second day after the operation the patient could urinate with greater ease, and the pain was so slight that he said he had not had so much comfort for a year; he could sleep four hours at a time during the night, whereas formerly he had been getting up once every hour, and had been urinating thirty times daily. The condition continued to improve. A further report was promised later.

Launois (*Ann. des Mal. des Org. Gen-Urinaires*, October, 1894) publishes an interesting memoir reviewing the whole subject, and bringing forward some collateral evidence, chiefly from the works of Godard, showing that monorchidism is likely to be associated with unilateral atrophy of the prostate, and giving instances of such atrophy after gonorrheal epididymitis, and of complete atrophy in cryptorchids, after syphilitic sarcocle, etc. He too concludes that the operation is of distinct curative value.

What might be called a supplementary indication for the operation will, I think, be found in some cases in which, with the usual urinary symptoms of prostatic overgrowth, there are others referable to the sexual system, and often causing more serious trouble. Every genito-urinary specialist is familiar with instances of "psychopathia sexualis" in old men, but not every one realizes that they often have a physical rather than a psychic basis, and depend on the prostatic congestion and excitation incident to the early stages of hypertrophy. In one of Haynes' cases the relief experienced in this direction was as marked as that derived from the disappearance of obstruction.

The details of several successful operations performed here will shortly be published.

The objections to the operation met with in practice have, in my experience, arisen altogether from the sentimental side of the question. As Launois says, men of advanced age, "aimant à se faire illusion," insist upon retaining their testicles as evidences of a "virilité passée." This applies of course with especial force to the cases in which dysuria is slight or catheterism easy, the general health remaining unaffected. As to the more serious cases, such as those I have noted, we have now reached a point in certainty of knowledge where we can promise results at least equivalent to those obtained by oöphorectomy for uterine fibroids, and I believe that the assertion made in my original paper was correct, and that "there will be no lack of cases willing to submit to an operation almost painless, with a low mortality, and followed by no such unpleasant conditions as accompany persistent fistulous tracts, either supra-pubic or perineal, even although the operation carries with it the certainty of sacrificing whatever sexual power has survived the excessive and often intolerable sufferings of such patients."

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## REMARKS ON THE CONTINUED FEVERS OF LOUISIANA.[1]

BY RUDOLPH MATAS, M.D.,
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PRESIDENT OF LOUISIANA STATE MEDICAL SOCIETY, ETC.

IN the nine years that have elapsed since the reading of my paper before this Society on the "Long-continued Fevers of Louisiana that Resist Quinin" my opportunities for observation have greatly increased, and I feel that I have gathered sufficient evidence to permit me to formulate a few conclusions pointing to the real nature of these fevers. In the paper referred to I insisted upon the distinctive clinical type of our continued fevers, and emphasized its differential characteristics from malarial fevers and from typhoid. I also confirmed the careful observations of Dr. John Guitéras, who had studied this form of fever in Key West, and had described it as an independent morbid entity in a paper published March 10, 1885, in the *Therapeutic Gazette*, under the title "Continued Fever, or so-called Typhoid Fever of the Tropics, or Continued Thermic Fever." I believed with him then that it was neither malarial nor typhoid nor a hybrid combination of both, but the result of some form of exhaustion of the heat-regulating apparatus.

It is now unnecessary to reproduce the clinical picture of the fever in question. We all know it, though we may call it by different names. I simply desire to supplement my paper of 1885 by expressing the opinion that the type of fever in question is not a new or independent morbid entity, but an atypical typhoid fever. This opinion is based upon the following conclusions derived from personal observation and experience and by clinical records which substantiate the facts:

1. The course of the long-continued fevers of Louisiana is not in the least altered or notably influenced by the cinchona alkaloids; ergo, it is not a malarial fever from the therapeutic standpoint.

2. That this fever occurs at all seasons of the year, though it is more prevalent during the summer months; ergo, it is not a "thermic" fever pure and simple.

3. That cases of the fever occur in groups (and probably in districts), several members of a household being attacked simultaneously or in rapid succession; ergo, infection from a common source.

4. That while the true classical and grave typhoid type of fever is exceptional and comparatively rare, it nevertheless exists in our midst in persons who are born in this city and who have never lived elsewhere; ergo, typical typhoid fever exists as an endemic in New Orleans.

5. That in the comparatively rare cases of typical typhoid fever all the essential characteristics of the typhoid state are present, viz.: long-continued fever, varying from four to six weeks, with typical chart; adynamic state, stupor, low muttering delirium, diarrhea, intestinal hemorrhages, perforation of the bowel and fatal peritonitis.

6. That in many other (less rare) cases the febrile movement, though long continued, presents few of the adynamic or ataxic characteristics of the typhoid state; the mental state is good, but diarrhea and intestinal hemorrhage are nevertheless present.

7. That in the majority of the cases the chief and apparently only characteristic of the fever is its persistence; its long duration and rebelliousness to antiperiodic or other medication. The only point of contact between this and the preceding types lies solely in the continued thermic movement.

8. In infected houses, where several cases are under treatment, it is not very rare to observe a fever of a most *typical* and grave typhoid type running through its course by the side of a benign *atypical* fever in which there are no adynamic symptoms, no diarrheas, no hemorrhages, nothing, in fact, but a simple and uncomplicated thermic movement.

I would now also state, as a matter of pure personal impression and belief without a sufficient basis of statistical facts outside of general personal observation, that it is my impression that:

1. The true malarial type of fever—the strictly intermittent—is gradually disappearing from the city limits, and is now almost restricted in its prevalence to the swampy portion of our suburbs.

2. That the continued type of fever is gradually gaining the ascendency, and the true typhoid type is yearly becoming more frequent.

3. That this gradual transition from the intermittent to the plain remittent continued, and, finally, to the continued typhoid type of fever, is a phenomenon that has been observed elsewhere, where the original conditions of nature gradually suffered profound alterations from the presence of a progressively increasing human population; that malarial fevers are the products of the unredeemed, uncultivated swampy lands, while the typhoid type is a product of human aggregation which usually follows in the wake of increased means of communication and other conditions inherent especially to metropolitan life.

4. That this transition in our fever-type is being effected gradually without any perceptible change in our water-supply, milk-supply, or food-supply, or in our sewerage-system or drainage-system, and that the only conditions that have changed have been the notable increase in the facilities for communication between this and other large northern and western metropolitan centers where the typhoid type of

[1] Read before the Louisiana State Medical Society, May, 1894.

fever has long predominated and whence it could be readily imported.

. . . . . .

Finally, a word as to treatment:

The vast majority of our cases are benign in their tendency, and require only symptomatic and hygienic treatment and careful nursing. The chief therapeutic indication is usually to control an excessive or hyperpyretic movement. In sthenic cases the antithermic remedies, especially phenacetin and antifebrin in small doses and in combination with some alcoholic, will meet the indication. My rule has been never to administer an antithermic dose (2 to 3 grs.) unless the temperature rises above 103°, and in the latter stages, when the patient is showing signs of exhaustion, never to give the dose until 104° has been reached.

In the asthenic cases stimulation, with proper nourishment, and the cold bath constitute my chief reliance. The method of Brand is far superior to all forms of antithermic medication, but it is difficult to apply in the homes of the poor, who are without help and unable to pay for the services of a competent nurse.

In the asthenic cases in which the ordinary antithermics are badly tolerated, and in which for fear of hemorrhages or other causes it is impossible to move the patient to the bath, I believe that the epidermic use of guaiacol by Sciolla's method and Da Costa's directions is of service in combating hyperpyrexia. I had a typical case which occurred a few months ago in which guaiacol did good service. As an adjunct of great value in reducing fever and in diminishing the tendency to delirium I always insist upon the use of the ice-bag or ice-pillow as a head-rest. All the other indications for complicating conditions should be met in the manner described in the classics.

## CLINICAL MEMORANDA.

### *OBSTETRIC MEMORANDA.*

BY B. C. HIRST, M.D.,
PROFESSOR OF OBSTETRICS IN THE UNIVERSITY OF PENNSYLVANIA.

#### A PELVIS SPINOSA.

CASE I.—A true spinous pelvis is very rare. So far as I know the condition has never been recognized before in America. It was referred to as early as 1697 by Hauder; again by Merz in 1790, and later by Denman, Burns and Duparcque, but was not clearly described until the appearance of Kilian's work, in the middle of the present century. The peculiarity of the spinous pelvis is the development at the ilio-pectineal eminences and along the crests of the horizontal rami of the pubic bones of sharp spicules and ridges of bone. Over the promontory of the sacrum and at the sacro-iliac junctions there may also be exostoses, but these are not shaped like thorns; they are buttons or knobs in form. It is possible to find sharp spinous projections of bone from other portions of the pelvis than the ilio-pectineal eminences and the crests of the pubes. Leopold has published a picture of a pelvis with a large thorn-shaped exostosis springing from the left ilium near the sacro-iliac junction. Kilian claimed that in the four cases he reported the sharp-pointed exostoses perforated the womb in each instance, and this has since been asserted to be almost a necessary consequence of labor in such a pelvis. But it was true of only one of Kilian's cases, and in some others more recently reported the uterine rupture can be demonstrated not to have been due to the exostoses at all. While sharp-pointed exostoses in the pelvis, therefore, can perforate the womb in labor, it is by no means certain that they will do so.

The woman in whom I recently discovered a spinous pelvis gave the following history: Mrs. S., aged twenty-four, married four years, has had two children. The first child died when two months old; the second was born two years ago. The woman has congenital osteomata on the heads of the tibiæ. A brother and a sister also have osteomata on the lower extremities. Her second child is alive and well, with no bony excrescences on its body. After the birth of her first child, three-and-one-half years ago, she first noticed a small, hard tumor over the posterior superior spine of the right ilium, extending down along the sacro-iliac junction. She had always enjoyed perfect health till after the birth of her second child, when she noticed a sudden and decided enlargement of the iliac tumor, which has steadily increased in size, and is now as large as a base-ball. During this period of constant growth there has been an increasing pain in the lumbar region, extending down the right leg to the great toe, evidently due to pressure upon the lumbo-sacral plexus.

Vaginal examination shows a sharp, bony excrescence springing from the left ilio-pectineal eminence, a ridge-shaped exostosis along the crest of the pubis, an outgrowth of bone over the right ilio-pectineal eminence not so pronounced as that upon the left side, and a large osteoma over the right sacro-iliac junction. The woman's history pointed to the possibility of pregnancy of a few weeks' duration. Should that be her condition, and should she return to the dispensary service, where I saw her, and which she has so far failed to do, I should induce labor three or four weeks before term, such a course being perfectly safe for the child and affording the mother all needful protection by securing the passage through her pelvis of a soft, compressible fetal head that will not grind a hole through the uterus between itself and the pelvic exostoses.

#### DIFFUSE UNLIMITED SUPPURATIVE PERITONITIS IN A PREGNANT WOMAN, ENDING IN RECOVERY.

CASE II.—In as thorough a search as it was possible for me to make through medical literature some three years ago, I was unable to find a single case of diffuse suppurative peritonitis during or after the child-bearing process saved by operation. This was in accord with my own experience. I had had a number of successful results in localized intra-peritoneal suppuration, even when one-quarter of the abdominal cavity was involved, but had never saved a case of diffuse suppuration. Five months ago I had my first success with this form of suppurative

peritonitis, and this is the first successful result I have any knowledge of, though it may well be that a few others are by this time on record.

Mrs. ——, a patient of Dr. M. Graham Tull, was seized at nine o'clock one evening last summer with violent abdominal pain. She was at the time four-and-one-half months pregnant. Dr. Tull found her with a distended, exquisitely sensitive abdomen, rapid pulse, and a temperature of 101°. There was no accounting for her seizure. On the following morning she was worse. By the afternoon Dr. Tull saw that an operation was necessary. I was sent for, and operated that evening about eight o'clock. The incision was median. A large quantity of thin pus ran out when the peritoneum was opened. The abdominal cavity and the intestines presented the typical appearance of diffuse suppurative peritonitis. There was no limitation, no demarcation between a diseased and a healthy area. Pushing the pregnant uterus aside, the origin of the trouble was discovered in a diseased appendix. There were also two ulcers on the caput coli excavated down to the mucous coat of the bowel. The appendix was removed, the ulcers oversewed, the abdominal cavity washed out, the walls closed and drainage for a few hours provided for. The woman made an uneventful recovery, and is about to be delivered at term.

The explanation of the recovery in this case is to be found, perhaps, in the lesser virulency of the infecting agent—the bacterium coli commune—compared with the streptococci, commonly the cause of the suppurative peritonitis after childbirth.

## A CASE OF ACUTE OSTEOMYELITIS IN AN ADULT, WITH EARLY OPERATION AND COMPLETE RECOVERY.

BY BAYARD HOLMES, M.D.,
PROFESSOR OF SURGERY IN THE COLLEGE OF PHYSICIANS AND SURGEONS OF CHICAGO.

THE diagnosis of acute osteomyelitis presents many practical difficulties, and the rarity of the disease makes it worth while to report every case observed during the first forty-eight hours. Old cases are common enough, and the diagnosis is easy when the pus is pouring out of a sinus or when sequestra are being discharged.

In June, 1893, it was my fortune to be called in the night to see a young man, about twenty-four years old, who was suffering great pain in the right leg. He had a temperature of 102.5° and a pulse of 108. The pain was constant and had been growing in severity during twenty-four hours. A surgeon had been consulted the day before and found no cause for alarm. The tibia was found exquisitely tender on pressure at a single point not more than an inch in diameter. There was no swelling or edema. A history of influenza and a short stay at the Hot Springs, Ark., was given. There were no other significant points in the history. A provisional diagnosis of acute osteomyelitis was made and the prognosis and indications for treatment explained. A hypodermic of morphin was given to relieve pain, and a cathartic was administered. In the morning the temperature was higher and the pulse more rapid. The pain and tenderness had increased. The family called Dr. Edmund Andrews and Dr. Christian Fenger in consultation. They saw the patient at different times of the day and confirmed the diagnosis and the indications for treatment. The temperature at night, eighteen hours after the first observation, was 105° and the pulse 124. The patient was partially delirious. The spot of tenderness over the middle of the tibia had become slightly swollen and edematous. The urine was examined, but no evidence of nephritis was found. Upon the following morning, thirty-six hours after the first observation, the patient was anesthetized and an incision made down to the tibia. The periosteum was distinctly edematous, and a yellowish serum poured out, which disappeared quickly upon sponging. The bone itself, at the point of tenderness, was more than ordinarily vascular, though the change was very slight. After chiseling away the anterior portion of the tibia near the middle of the bone a distinct vascular mass was found, in the center of which was a drop or two of pus. The sharp spoon was used to scrape out the surrounding tissues, and the wound was packed with iodoform-gauze. The upper and lower ends of the wound were brought together and the middle left open to secure drainage. The leg was put in a plaster-of-Paris cast. Upon the morning after the operation the temperature was normal and never rose again. The appetite immediately returned, and the patient felt the restraint which the cast imposed. The second dressing occurred about ten days after the injury, and at that time the tissues showed no sign of infection or inflammation. Upon the fifth dressing the wound had entirely closed, leaving a defect of bone underneath the skin.

Some weeks after the recovery the patient was getting on to a moving train and was thrown upon the ground, sustaining a simple fracture of this tibia at the point of operation. From this recovery is said to have taken place in the usual time.

## EYE-STRAIN A CAUSE OF NOCTURNAL ENURESIS.

BY GEORGE M. GOULD, A.M., M.D.,
OF PHILADELPHIA.

ON November 12, 1891, a little girl, M. S., nine years of age, a "nervous child," with headache, no appetite for breakfast, etc., was brought to me for treatment. The mother stated that the child slept very poorly, having frequent night-terrors, was somnambulistic, and had "other troubles," the nature of which I did not exactly learn until subsequently. Under a mydriatic I found the following remarkable error of refraction:

R. + sph. 0.75 D. ⊃ + cyl. 5.00 D. ax. 100° = 20/70.
L. + sph. 1.00 D. ⊃ + cyl. 5.00 D. ax. 85° = 20/70.

After wearing the glasses I then prescribed the visual acuteness became in a short time normal in the right eye, but it was a year or more before I succeeded by the "blinder-treatment" in bringing that of the left eye to normality. The headaches soon passed away after getting glasses, likewise the nightmare, and the appetite became good. Within a year the child was as robust and hearty as could be desired. At this time I first learned that for years prior to consulting me the child had been afflicted with nightly enuresis, for which all treatment had been in vain. This had continued up to

the day of instilling the mydriatic and applying glasses, but from that day it has never occurred once since.

The second case was not cured so suddenly, as the circumstances, age of the patient, continuance of the malady, etc., were not by any means so favorable. The boy was fourteen years old, had been afflicted with frontal headache "all his life," and had also had "fainting spells" for a number of years. There had also been a frightful nasal catarrh. Many physicians and surgeons had been consulted for nocturnal enuresis that had persisted from infancy, but all treatment and operations had been without effect. I found a high degree of compound hyperopic astigmatism and hyperphoria. After prescribing glasses the headache disappeared at once, and a partial ptosis of the left lid also disappeared. The wetting of the bed did not stop immediately, but did do so "very soon afterward." The patient disappeared from view, and it is only lately that I have learned that the enuresis stopped soon after getting glasses, and has not appeared since. The parents now ascribe the cure to the glasses, and I agree with them. As general treatment of the boy's health was also instituted by me, a legitimate suggestion might arise that the cure of the enuresis might have been due to that instead of to the stoppage of eye-strain. General treatment, however, had been previously thoroughly tried, but in vain until the ocular treatment was added. Taken in conjunction with other cases, I think that the reflex had its source in the eyes.

Another little girl, G. M., eight years of age, was brought to me December 14, 1889, with a history of headaches and of chorea during the preceding four years. The choreic affection was limited to the face and to the hands and feet. She was a very restless child, the hands and feet jerking and moving all the time, even in sleep, and "she talked in her sleep all night." Nocturnal enuresis had likewise existed for four years, and occurred every night. In this case there was difficulty in getting the child to wear glasses correcting the anisometropia. The chorea and other symptoms gradually ceased during the first month or two, but resumed again with their old intensity when she "lost her glasses" and was without them for two months. In June, six months after the first visit, I again took the case up, and prescribed other glasses, and they were now worn continuously. On October 2, 1892, with great patience, I succeeded in getting a still more accurate correction of the error of refraction (compound hyperopic astigmatism), a task of the utmost difficulty. But long prior to this date the enuresis, chorea, night-terrors, etc., had entirely disappeared. The nervous system had been so profoundly deranged that a sudden cure was not to be expected, but that the eye-strain bore a causal relation to the symptoms of enuresis and chorea, I have no doubt.

On March 12, 1894, a little girl, M. S., six years of age, was brought with a history of great nervousness, kicking about and crying out in her sleep, headaches, painful eyes, etc., and with nightly enuresis. From the day glasses were give her these symptoms disappeared "as if by magic."

On October 13, 1894, Dr. O. P. Rex sent me a child of ten years, H. S., who had headache a great deal, and painful eyes. I did not at this time know that the child had been afflicted with persistent noctural enuresis for years, for which all treatment had been in vain. I found the following vicious error of refraction:

R. and L. + sph. 4.50 D. ⊃ + cyl. 2.00 D. .ax. 90°

This gave her only 20/100 visual acuteness, which, however, soon improved by wearing the glasses, until one eye had normal acuity in a few weeks, and the other by the blinder-treatment is steadily gaining. Headache, etc., at once disappeared, and from the day of applying the glasses the child never "wet the bed" again.

Besides these cases I have had others in which I am moderately certain that the eyes were the ultimate or a contributing cause of the affection under discussion, but in which the cure was either more slow or the etiology more suspicious, and I do not include them in this report.

## MEDICAL PROGRESS.

***Traumatic Ophthalmoplegia Improved by Operation.***—GUTMANN (*Berliner klinische Wochenschrift*, 1894, No. 41, p. 933) has reported the case of a man, thirty-six years old, who struck upon the head in a fall down stairs, suffering a fracture at the base of the skull. He was unconscious for three weeks, and when he came under observation, four weeks later, he presented complete left-sided oculo-motor palsy. There existed ptosis, and the eyeball was directed outward in abduction. There was no movement upward, and only so much of movement downward as could be effected by the fourth nerve. The pupil was dilated, and accommodation was paretic to the degree of three diopters. Slight movement inward was possible under great effort. In the hope of affording relief operation was undertaken. A fold of the upper lip, about 10 or 15 mm. (0.39 or 0.59 in.) wide, was made with its base about 3 mm. (0.11 in.) above the margin of the lid, the fold being freed at an elevation of between 10 and 15 mm. Above the brow a horizontal incision of from 15 to 20 mm. (0.59 to 0.78 in.) long was made. The skin between the upper margin of the fold and the incision above the brow was freed, and the fold slipped under the bridge of tissue thus formed, its upper margin being sutured in the upper wound. As a result the lid could be conveniently elevated and depressed. After waiting for three months, without noteworthy improvement in the activity of the internal rectus, this muscle was advanced, while the external rectus was freed. With the aid of lenses, + 3 D upon the left and + 1 D upon the right, the patient was afforded useful vision. In the course of a short time, however, the internal rectus induced a secondary strabismus convergens, so that now its tendon was divided. A slight degree of diplopia, however, persisted, for the relief of which a prism five degrees, base out, was directed. The movement of the eyeball upward and downward was, of course, not affected. Three years later the result was still found to be satisfactory.

***Acetonuria Following Anesthesia.***—The occurrence of several cases of fatal diabetic coma following anesthesia, led BECKER (*Sitzungsber. d. niederrh. Gesell.*, Bonn., 1894; *Centralbl. f. Chirurgie*, 1894, No. 38, p. 895) to investigate whether or not anesthesia induces acetonuria in healthy persons. Seven hundred individual observations were made upon 188 anesthetized persons, with a

positive result in two-thirds of the cases. The acetonuria began as a rule several hours after the anesthesia and lasted for several days. The result was independent of special form of anesthesia, the duration of the anesthetic period, as to whether it was preceded or not by injections of morphin, or if attended by more or less excitement. If acetonuria existed before the induction of anesthesia, the condition was considerably intensified. In one case of ethyl-bromid intoxication enormous quantities of acetone were excreted in the urine. The conclusion is reached that small quantities of acetone circulating in the blood during and subsequent to anesthesia are not toxic, but that it remains to be demonstrated whether or not such an effect is produced in cases in which accidents happen. The occurrence of acetonuria is viewed as an indication of increased albuminous disintegration, and it is thought possible that in patients with profound metabolic disturbances acetonemia may prove a serious complication.

***The Pathology of the Spinal Lesions of Divers' Palsy.***—SHARPLES (*Journal of Nervous and Mental Diseases*, vol. xxi, No. 10, p. 636) has reported the case of a deep-water diver who, after descending to a depth of twenty-one feet and reaching the surface, complained of sharp pains in the arms and legs, and almost at once became unconscious, thus remaining for about one-and-one-half hours. The arms and legs were motionless, while some sensation remained in the arms, although completely absent in the legs. The tendon-reflexes in the arms and legs were wanting, as were also the skin-reflexes. The rectal and vesical sphincters were paralyzed. Symptoms of pneumonia appeared, cystitis and bed-sores developed, and death resulted from septicemia. Upon post-mortem examination evidence was found indicative of the occurrence of numerous hemorrhages in the cervical cord, with secondary softening and inflammatory changes affecting especially the posterior and lateral columns of the cervical and upper dorsal portions.

***Gangrene of the Lung Following Pleuro-pneumonia.***—GOELET (*North Carolina Medical Journal*, vol. xxxiv, No. 5, p. 217) has reported the case of a man, twenty-three years old, addicted to alcoholic excess, in which, on the sixteenth day of an attack of pleuro-pneumonia, the expectoration became offensive, and in a short time unequivocal symptoms of gangrene of the lung appeared. Under treatment with spirit of turpentine, 5 drops, fluid extract of eucalyptus, 5 drops, and beechwood creosote, 2 drops, every two hours, with frequent inhalations of the vapor of turpentine, marked improvement soon ensued, and in the course of a month the patient was able to sit up, and the temperature and bowels had become normal. At the inferior border of the left scapula there persisted an area of dulness on percussion, some three inches in diameter, in which the respiratory sounds were not to be heard.

## THERAPEUTIC NOTES.

***The Treatment of Diphtheria with the Antitoxin.***—At a recent meeting of the Medical Society of Hamburg, RUMPF (*Münchener medicin. Wochenschr.*, 1894, No. 47, p. 938) reported the results obtained in the new General Hospital from the employment of Behring's antitoxin in the treatment of diphtheria. Twenty-six cases were thus treated, the clinical diagnosis being confirmed by the results of bacteriologic examination in all of the cases but one. Eighteen of the cases came under observation on the second day of the disease, 3 on the third day, and 5 later. All were in children between the ages of ten months and 12 years. Among the whole number there were 2 deaths (8 per cent.): 1 among the group of 18 cases, the other among the group of 5. Four of the cases were mild, 8 moderately severe, and 13 severe. Tracheotomy was performed in 7 cases; among this number were 2 fatal cases. The injections were made into the abdominal wall. In not a single instance was there any local reaction. In 11 cases the temperature appeared to be influenced by the injections; in 3 it rose, while in 8 it declined. In several cases the false membrane continued to spread. Albuminuria was found in 8 cases, in 1 of which it had not been present before the injection. The complete statistics for several months showed that there had been 91 cases of diphtheria in the hospital, with 11 deaths (12 per cent.). On bacteriologic examination of the kidneys and spleen from all fatal cases of diphtheria for a given period it was possible to isolate streptococci in 27 of 42 cases.

***The Treatment of Anemia, Particularly Chlorosis, by Means of Sweating.***—KÜNNE (*Deutsche medicinische Wochenschrift*, 1894, No. 44, p. 846) reports the employment of sweating in the treatment of forty cases of anemia, including twenty-three of chlorosis. He employed a spring mattress, within which passed hollow coils, and over which was placed a support of wire netting, which was covered in turn with sail-cloth, and upon this the patient was placed and covered with woollens. By means of a spirit-lamp the air passing through the coils within the mattress is heated, and the warmth is in this way conducted to the patient. The application is thus continued for from an hour and a half to two hours and a half, after which the patient remains for a similar period in an ordinary bed. In the cases treated in this manner the number of corpuscles in the blood and the amount of hemoglobin rapidly increased, as a rule reaching four-millions of the former and 80 per cent. of the latter in the course of from six to eight weeks; at the same time there was appreciable increase in bodily weight. The subjective symptoms likewise receded, the menstrual derangement persisting longest. In conjunction with the sweating iron was also administered, and gentle out-of-door exercise was recommended.

***Nitro-Glycerin for Singultus.***—GRISWOLD (*Journal of the American Medical Association*, 1894, vol. xxiii, No. 17, p. 646) has reported a case of obstinate singultus in an habitual alcoholic fifty years old, which, after the failure of other measures, was controlled by the administration of a pill of nitro-glycerin, gr. $\frac{1}{100}$, given at intervals of three hours. The hiccup ceased after the administration of the fifth pill.

***For Intercostal Neuralgia.***—

℞.—Linimenti belladonnæ . . . f℥j.
Linimenti chloroformi . . . f℥iv.
Linimenti opii . . . . ad f℥iij.
Misce et fiat linimentum.
To be well rubbed over the painful area.

*The Practitioner.*

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SATURDAY, DECEMBER 15, 1894.


## THE TREATMENT OF DIPHTHERIA WITH THE ANTITOXIN.

SERUM-THERAPY is the logical outgrowth of the modern doctrines concerning the infectious diseases. The fundamental ideas underlying it have for a long time been appreciated, and we have to thank the bacteriologists for rendering of practical therapeutic value our knowledge concerning immunity. The present methods of producing immunity are merely modifications of those used by PASTEUR in dealing with chicken-cholera and with anthrax, and by his followers with symptomatic anthrax and the pyocyanean infections. PASTEUR'S work was inspired, no doubt, by the success of JENNER'S vaccination, the latter having been led to his experiments by observing the insusceptibility to smallpox of individuals who had survived the disease whether contracted from ordinary exposure or by inoculation, after LADY MONTAGUE had brought back that method from China.

In the earlier immunizing experiments, the living virus in some form, either in full strength, or weakened by heating or by the action of chemic agents, was introduced into the animals experimented upon. Some time later, TOUSSAINT, CHAUVEAU, SALOMON and SMITH, and CHARRIN, showed the feasibility of chemic vaccination, *i. e.*, they proved that the products of the bacteria causing a specific infection were capable, when injected into certain animals, of setting up in them immunity from the disease. KOCH'S treatment of tuberculosis consisted simply in the injection of a glycerin extract (tuberculin) of cultures of the tubercle-bacillus, and was really an attempt to produce immunity by the action of the chemic products of the bacilli.

It was early learned that immunity is not reached immediately after the introduction of the vaccinating substances into the body. There must first be a reaction on the part of the organism (the tuberculin-reaction is an example familiar to all) to the virus or toxin, after which a greater or less degree of immunity or lessening of susceptibility follows with the lapse of a certain time. The workers were agreed that the only way to arrive at a knowledge of the changes brought about in the body through an infectious disease which renders the animal subsequently insusceptible to the same disease lay in a careful examination of the tissues and fluids of the body before, during, and after the period of infection. The work of FODOR, GROHMANN, and especially of NUTTALL demonstrated conclusively the germicidal power of normal blood-serum, a property which the serum possesses in common with its globulicidal and antitoxic activities (BUCHNER). Whether these properties are possessed by the serum entirely independently of the cells of the body, or whether they are due to the presence of substances in the serum which have had their origin in the cells, are still disputed questions, though there can be but little doubt that the latter view will prove ultimately to be the correct one. It has been thought that natural immunity, or the natural resistance which an animal offers to an infectious agent is to be explained by the presence in the blood-plasma of these protecting substances (alexins).

NUTTALL, in his experiments, proved that the blood-serum taken from an animal rendered artificially immune from anthrax was capable of killing a greater number of anthrax-bacilli than the blood-serum of an ordinary healthy animal. HÉRICOURT and RICHET demonstrated that the blood of a dog which had been inoculated with a culture of the staphylococcus pyosepticus, and had recovered from the infection, when injected into rabbits rendered these immune from the same virus. BEHRING and his co-workers went a step further, and showed that

blood-serum taken from an immunized animal was capable not only of producing immunity from the same infectious agent in another animal, but also of curing or "healing" an infection already in progress. In 1890 BEHRING established these facts for diphtheria, and soon after in association with KITASATO proved the same to be true for tetanus.[1]

The early skepticism with regard to the possibility of the production of immunity against diphtheria was attributable, no doubt, to the fact that diphtheria, like pneumonia, is a disease of which an individual may have more than one attack. As a matter of fact, a patient who has once had diphtheria seems after a certain time to be more susceptible than an ordinary person of being attacked by the same disease. The creation of an artificial immunity to smallpox or scarlet fever would have seemed more easily understandable than that of an artificial immunity from diphtheria or from pneumonia. Nor is it surprising that the same misunderstanding should have existed concerning anthrax until it was shown that animals could by artificial means be rendered immune from the disease. The conception of immunity had, therefore, to be widened considerably, and it seems necessary to make it a relative term; there are varying grades of resistance to infection, and varying lengths of time during which such resistance is valid, so that we can speak of a partial or a complete, of a temporary, or of a permanent immunity. In diphtheria and pneumonia it is probable that a surviving patient does not become immune immediately after the cessation of the serious symptoms; it would seem rather that changes gradually occur in the body, bringing about immunity until a period of acme is reached which lasts for some time, and after which protection against reinfection becomes less and less certain, until finally the individual is quite as susceptible, or even more so, than one who has never passed through the disease.

LOEFFLER was probably the first to render an animal immune to the virus of diphtheria. A guinea-pig which he inoculated with a small quantity of a pure culture of the bacillus recovered from the infection, and afterward proved to be resistant to repeated inoculations with virulent cultures. BEHRING, FRAENKEL, BOER, LÜBBERT, and WERNICKE have tested various methods for producing artificial immunity from diphtheria, among them vaccination with sterilized bouillon-cultures, with bouillon-cultures treated with iodin trichlorid, or with tissue or tissue-juices of animals sick or dead of diphtheria, and also by feeding with the toxins of the diphtheria-bacilli. BRIEGER, KITASATO, and WASSERMANN in the beginning of 1892 grew diphtheria-bacilli in thymus-bouillon, thinking, according to BEHRING, erroneously, that the thymus-extract exercised an antitoxic influence on the specific diphtheria-poison. They used the product thus obtained for purposes of vaccination. Results have taught, however, that immunity against diphtheria can be most successfully produced and can be carried to the highest grade by beginning with injections of much weakened and highly diluted virus.

The principal drawback to the application of serum-therapy to human beings has lain in the difficulty of securing a serum which holds the healing or so-called "antitoxic" substances in sufficient concentration. Large animals have to be used, and these must be inoculated repeatedly with gradually increasing quantities of virus or toxins until the serum has acquired a tolerably high degree of antitoxic activity. The preparation of the serum according to BEHRING'S method at Höchst-on-the-Main is carried on at considerable expense. The cultures, standard toxin-solutions and control-experiments are made in a well-equipped bacteriologic laboratory. Near by are the stables in which the larger animals, such as horses, cattle, and sheep are kept. For the preparation of the diphtheria-antitoxin young horses, healthy except, perhaps, for slight blemishes, are kept under observation for some days, after which the first injection of the virus is given. The animal receives subcutaneously in the region of the shoulder a quantity of an old bouillon culture of diphtheria-bacilli which has been nearly freed from organisms by filtration or simply by decantation; to this is added 0.5 per cent. of carbolic acid. The mixture is well diluted with water, and sufficient is injected to set up a mild reaction, the temperature reaching 39° C. or a little more. The animal loses its appetite, fails in weight, and there is edema in the neighborhood of the site of the injection. If the dose has been rather too large there may be paresis of the posterior limbs. It

[1] It would almost seem as if Mithridates, a hundred years before Christ, had some glimmerings of immunity and blood-serum therapy. His skill in devising chemic antidotes for deadly poisons is well known; but he went even further than this, for Pliny states that having noticed that the ducks of Pontus fed on poisonous substances, he used their blood to mix with his antidotes, so as to make these even more efficacious; *sanguinean anatum Ponticorum miscere antidotis quoniam veneno viverent.*

is sometimes difficult to estimate just the amount which will evoke the proper reaction, although control-experiments on guinea-pigs serve to a certain extent as a guide to the toxicity of a given injection-fluid. The injections must not follow one another too quickly; the animal is allowed to fully recover before a second dose is administered.

A horse, after receiving injections at intervals of from one to four weeks, becomes only very gradually immune, and it is not until the end of from four to six months that the serum has gained any considerable antitoxic power. The amount and strength of the virus are gradually increased as the immunizing process proceeds, so that finally an animal is able to bear several liters of undiluted toxin-solution. It is to be noted, however, that the antitoxic value of the blood-serum of the immunized horse bears no definite relation to the amount of toxin that has been introduced into his system. The antitoxic strength of the serum of the horse has to be tested from time to time by experiments on guinea-pigs, the serum being tried not too soon after an injection of the virus. When the desired antitoxic strength has been attained, from one to three liters of blood are drawn through a canula from the jugular vein into sterilized vessels, and cooled in the ice-box for from twelve to fourteen hours. The serum is then poured off, and after 0.5 per cent. carbolic acid has been added its exact antitoxic strength is tested upon animals. After the blood has been extracted the animal is usually hungry and thirsty. If it bears the blood-letting well the process may be repeated two or three times in the course of eight days, after which there must be a renewal of the vaccinations for several weeks.

(To be concluded.)

## EDITORIAL COMMENTS.

***Foot-ball Rowdyism***, we had hoped, would have ended with the "Thanksgiving games," but worse than the fact, now come interminable defenses of the fact. The disgrace of the games was bad enough, but the defenses of the present-day game are so much worse that deaths (of which there have been one or two more since our last issue) and broken bones and sluggings and brutality are as nothing to it. The sly silences, the tricks of logic, the evasiveness, the wrigglings, "bluffs," bravado, and "whitewashings" of foot-ball would be most amusing if it were not the sorriest, the saddest spectacle of the day. The subterfuge and illogicality of calling this brutality "athletics" is unpardonable. Foot-ball and its defenses are, of course, as great crimes against athletics as against education. The spirits of the men who endowed institutions of learning for purposes of mental and moral training will yet rise from their graves and demand an accounting on the part of the modern holders of the trust. These will be found in time to have done education the greatest of all injuries, as they have by their own action largely lost the respect and confidence of the community, and in future rich men will, we fear, consider too well the clauses in their wills that give money to institutions for the discouragement of intellectual and scientific athletics and for the encouragement of the intercollegiate foot-ball variety. For a time, it is true, the "student" is the master, and the professor is his devoted flatterer and servant.

But for a time only. Luckily enough, there are signs that in the colleges there are still left some lovers of true athletics and of true education. They have too long kept still in face of the noisy degraders of both. Luckily enough, also, the "common people" have not also lost their heads. Everywhere mothers and fathers and guardians are looking about them for colleges whose chief aim is not to advertise their "educational" institutions by foot-ball matches. Mothers have been known to go on the "gridiron" and take their sons off from the fire. In the last fifteen years the growth in the academic department of Yale has been from 612 to 1159, and in the scientific department from 190 to 665. In Harvard, in the same time and in the respective departments, it has been from 843 to 1667, and from 37 to 320. Thus the growth at Harvard has been much greater than at Yale, and yet during the same years Harvard has won but a single foot-ball game with Yale and only four boat races. Thus the very fundamental premise of foot-ball logic is a proved fallacy. Still another sign of coming sanity (would there were more) is the public announcement by one great institution (Pennsylvania) that would-be players must henceforth be "amateurs, bona fide students in good standing, of one year's residence at the University, and who have passed the annual examinations upon a full year's work." But how soon shall we hear of the greatest scholar being honored by his college and by his fellows, as to-day is the flattered, bepictured, and bepraised hero of the gridiron? Despite the "athletic" craze in England, the senior wranglers are the most honored of the children of the universities. But who is most honored with us? The nation that values brawn and brutality more than intellect and learning will assuredly get what it wishes. But will what it gets be the best thing for it, or for civilization?

***The Removal of Foreign Bodies from the Cornea.***—Mechanics and workmen have learned from oculists (who should have taught them better) the method of removing foreign bodies from the cornea by "picking them out" with some sharp or slightly blunted metal instrument. In every factory or workshop every day, and often many times a day, it occurs that pins, knives, etc., are thus blunderingly used, frequently with great injury to the cornea, with the resultant formation of corneal ulcers, keratitis, iritis, or at least, leucomata. All text-books of ophthalmology advise the use of the "corneal spud" for removing such particles, and every young physician supplies himself with the instrument. But it is the most outrageously ill-adapted for the purpose conceivable. It is impossible for any patient to hold the eye still enough to permit any hand thus to remove a

partly-imbedded grain of sand, or emery, or what-not, without wounding the epithelium of the cornea. For this purpose a rigid tool is absurd, and a rigid metal instrument is the acme of absurdity. Every physician should teach workingmen how easy it is, and how free from any danger of injury, to remove the great majority of foreign bodies on the cornea with a simple wisp of cotton. Any particle not thus removable should not be sought after with pen-knives, awls, pins, or spuds, but the patient should be sent to a physician. Twist a little wisp of absorbent cotton, having long fibers, upon itself until the fibrils are well caught, but are not too densely packed, upon each other. Fold the roll upon itself and grasp it half an inch from the rounded or curved extremity. The eyelids are held apart by the fingers of the left hand, and the patient instructed to look in such a direction as to bring the foreign body into view. By delicate, though firm pressure, the wisp of cotton is brushed, not too quickly, across the cornea, or it is given a slight twist or screw-like movement when deftly pressed against the cornea. Almost invariably the dust-particle is removed at the first trial, being entangled or caught by the fibrils of the cotton. Cocain, blepharostat, spud, time, labor, and injury, are all dispensed with and happily spared. The procedure may not be for the commercial advantage of the specialist, but it is worth more to the world than seven "original researches' and prize-essays.

***Great caution is needed*** in the matter of supply of the antitoxin of diphtheria. Analyses have been made of some samples in the market, and, while these have been found harmless, they have also been shown to be absolutely inert. A report is current that ARONSON has separated the active principle from the serum, and that he is "working in association" with a noted firm of chemists which is proceeding to patent the invention. Should such an outrage prove true, it will be a great scandal to medicine. The *New York Herald* has started a subscription, itself leading off with $1000, to provide serum for the poor. The lay public and the newspapers should leave this matter in the hands of the medical profession. Such a movement as that of the *Herald* can only bring harm in the long run. In the present condition of the public pulse, and with the infinitesimal amount of the antitoxin obtainable, it can have no other effect than to enormously enhance the price of what serum is to be had. Moreover, it is by no means certain, despite all that has been reported, that the agent is of so great therpeutic value as it is considered to be. Perhaps the whole thing may prove a failure. Above all, let us have no silly or insane haste, and no debasing commercialization of the means of treatment. Let science and professional experiment dictate and guide, and let us wait until the assurance and the guidance is beyond all doubtfulness and deceit.

## CORRESPONDENCE.

### CASTRATION FOR THE CURE OF HYPERTROPHIED PROSTATE.

*To the Editor of* THE MEDICAL NEWS,

SIR: The evidence summarized in my communication on page 664 of this number of THE NEWS obviously and amply justifies the suggestion made by me last year, and which was not made without hesitation. Having observed with disapprobation the undiscriminating assaults of some extremists upon the urethra the tubes, and ovaries, and more recently upon the appendix, I did not want to be responsible for a similar attack upon the testicles. I therefore took pains to say that I had as yet arrived at no definite conclusions, but was still seeking further light on the subject, knowing that the step from experiment to operation is and should be a long one, and feeling the responsibility involved in proposing any new operation, especially one of this character, easy of performance, with a low mortality and intended for the relief of a condition of enormous frequency. This appears to me to have been a proper attitude, but Mr. Mansell Moullin has recently twice gone to the trouble of calling attention to the way in which I introduced the operation, each time coupling his remarks with the statement (made by him once before) that he suggested it to a patient in November, 1892. If his motive for this thrice-repeated assertion is the apparent one of a claim of priority of thought, it would be easy for me to establish the facts that I told Dr. John S. Billings, of Washington, my views on the subject in the early summer of 1892, and that I outlined my experiments and instructed my assistants in regard to them in October of the same year. This would antedate both Mr. Moullin's "suggestion" and Ramm's operations. But these are puerilities. I believe that the surgeon who, before submitting his patients to a hitherto untried operative procedure, seeks the criticism of his colleagues, occupies a sounder position than he who, with neither experimental evidence nor professional backing, bases his advice on what, in this instance, must have been little better than guesswork. As I have already said, I have no wish to claim operative priority, and the question of vague suggestions to anonymous patients is too insignificant to merit attention. But I would like to be credited with having been the first to undertake a series of experiments to determine the effect of castration on the prostate, and the rapidity of that effect, with a view to the therapeutic value of the operation, and then with having, with what still seems to me proper caution, presented for the first time the whole subject to the profession, with the evidence upon which my suggestion was based. The operation appears to have come to stay, and in view of the wide field which it may some day occupy, it is not unnatural that I should desire to have my relation to its introduction and adoption kept straight as a matter of record. I am, sir, yours, etc.,

J. WILLIAM WHITE.

1810 SOUTH RITTENHOUSE SQUARE, PHILADELPHIA.

## NEWS ITEMS.

***Albert Napper***, the originator of cottage-hospitals, died on November 16th, at the age of seventy-nine years. He established the first cottage-hospital in 1859.

***Medical Director John Mills Brown, U. S. N.***, retired, died in Washington, D. C., on December 7th, at the age of sixty-three years.